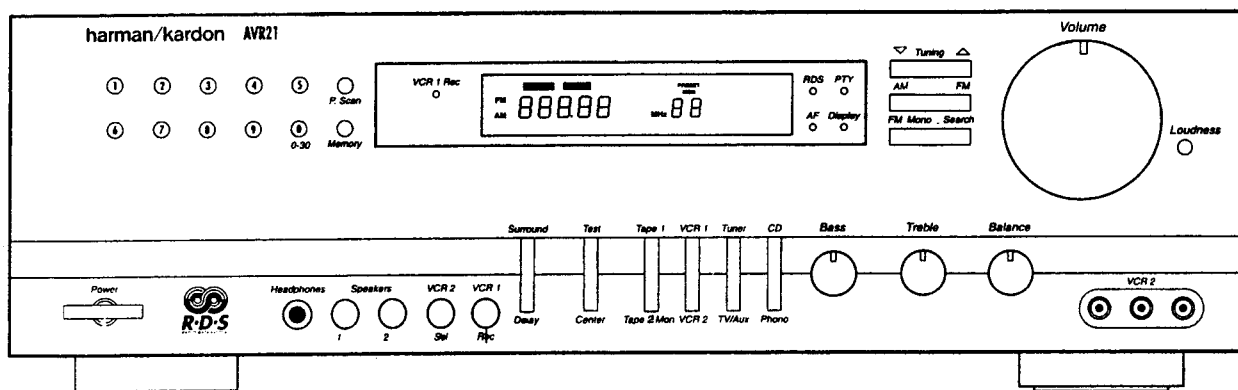


# The Harman Kardon Model AVR21

Manual A

## AUDIO AND VIDEO RECEIVER

# Technical Manual



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**harman/kardon**

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1112-AVR21A G9603 1200

## SPECIFICATIONS

### ● FRONT AMP SECTION

	Nominal	Limit
RMS Output Power (Stereo Mode) Input: CD THD < 0.09%, 8 ohms Both Channel Driven (40 Hz-10 kHz)	≥ 65 W	≥ 63 W
(Surround Mode) THD < 0.09%, 8 ohms, 1 kHz	≥ 55 W	≥ 50 W
Im Distortion, Input : CD At 63 W, 60:7000 Hz = 4:1	≤ 0.2%	≤ 0.3%
THD (40 Hz-10 kHz) at 8 ohms, 63 W Input: CD		
40 Hz	≤ 0.06%	≤ 0.09%
1 kHz	≤ 0.06%	≤ 0.09%
10 kHz	≤ 0.06%	≤ 0.09%
Input Sensitivity		
Phono (MM)	2.5 mV	±0.4 mV
CD, AUX, VCR	150 mV	±30 mV
S/N (WTD IHF-A) Input Shorted at Volume Max		
Phono	≥ 74 dB	≥ 70 dB
CD, Tape1, 2	≥ 92 dB	≥ 90 dB
TV, VCR1, 2	≥ 82 dB	≥ 80 dB
Phono Overload at 1 kHz, THD : 0.5%		
Phono Input → Tape Mon. Output	≥ 140 mV	≥ 130 mV
Phono Equalization		
RIAA 30 Hz-15 kHz, Tape Mon. Output	RIAA dB	±1.5 dB
Tone Control		
Bass, 100 Hz	±10 dB	±2 dB
Treble, 10 kHz	±10 dB	±2 dB
Loudness control at -40 dB		
100 Hz	±6 dB	±2 dB
10 kHz	±3 dB	±2 dB
Frequency Response		
CD/AUX		
20 Hz, 20 kHz	±0.5 dB	±1 dB
Channel Crosstalk, Input Shorted		
1 kHz	≥ 60 dB	≥ 50 dB
10 kHz	≥ 50 dB	≥ 40 dB

### ● CENTER AMP SECTION

	Nominal	Limit
RMS Output Power THD < 0.3%, 8 ohms, 1 kHz Only Center Channel Driven	≥ 55 W	≥ 50 W
S/N Input Shorted, IHF A WTD Line Input : 350 mV	≥ 67 dB	≥ 65 dB
Frequency Response at -3dB		
Normal	100-20 kHz	150-15 kHz
Wide	20-20 kHz	50-15 kHz

### ● REAR AMP SECTION

	Nominal	Limit
RMS Output Power THD < 0.7%, 8 ohms, 1 kHz	≥ 55 W	≥ 50 W
Only Rear Channel Driven		
S/N Input Shorted, IHF A WTD, Delay : 20 mS, Line Input :350 mV		
Dolby	≥ 60 dB	≥ 55 dB
Hall	≥ 60 dB	≥ 55 dB
Frequency Response at -3 dB 8 ohms, Dolby Pro-Logic	80-7 kHz	100-6 kHz

### ● VIDEO SECTION

	Nominal	Limit
Input Sensitivity/Impedance VCR1, VCR2, VDP	1Vp-p/75 Ω	±1 dB
Output Level/Impedance VCR1, REC. out, TV Mon. Out	1Vp-p/75 Ω	±1 dB
Frequency Response at -3dB	DC -10 MHz	5-6 MHz
Crosstalk at 1.0 MHz	≥ 45 dB	≥ 40 dB

### ● FM SECTION

	Nominal	Limit
Tuning Cover Range, 50 kHz Step		
Low	87.5 MHz	
High	108.0 MHz	
Usable Sensitivity		
S/N : 26 dB	≤ 11.2 dBf	≤ 17.2 dBf
Image Rejection (at 106 MHz)	≥ 80 dB	≥ 70 dB
IF Rejection (at 90 MHz)	≥ 110 dB	≥ 100 dB
Full Limiting (at -3dB)	≤ 12.2 dBf	≤ 15.2 dBf
50 dB Quieting Sen. at 98 MHz, 40 kHz DEV.		
IHF Band Pass Filter		
Stereo	≤ 45.3 dBf	≤ 48.3 dBf
Distortion (1 kHz, 100% MOD at 98 MHz)		
IHF Band Pass Filter		
Mono	≤ 0.3%	≤ 0.6%
Stereo	≤ 0.5%	≤ 0.8%
Signal-to-Noise (1 mV Input, 100% MOD at 98 MHz)		
IHF Band Pass Filter		
Mono	≥ 70 dB	≥ 65 dB
Stereo	≥ 65 dB	≥ 60 dB
Frequency Response: +1, -3dB	20-15.5 kHz	30-15 kHz
AM-Rejection Ratio (100 μV-20mV Input)	≥ 60 dB	≥ 50 dB
Search Level (at 98 MHz)	31.2 dBf	± 5 dBf
Automatic Stereo Threshold (at 98 MHz)	31.2 dBf	± 5 dBf
Muting Threshold (at 98 MHz)		
Overload at 98 MHz (100% MOD 100 mV RF Input)	≤ 0.5%	≤ 0.8%

Suprious Response (at 98 MHz Antenna Input 3 $\mu$ V)	$\geq 70$ dB	$\geq 60$ dB
Capture Ratio 40/60 dBf	$\leq 2$ dB	$\leq 2.5$ dB
Alternative Channel Selectivity (Input at 98 MHz) $\pm 400$ kHz	$\geq 65$ dB	$\geq 55$ dB
Stereo Separation (100% MOD, 1mV Input at 98 MHz)		
IHF Band Pass Filter		
100 Hz	$\geq 40$ dB	$\geq 35$ dB
1 KHz	$\geq 45$ dB	$\geq 40$ dB
10 KHz	$\geq 35$ dB	$\geq 30$ dB
Output Voltage (at 40 kHz DEV, 1 kHz MOD, 1 mV Input)		
Mono	500 mV	$\pm 150$ mV
Stereo	450 mV	$\pm 150$ mV
RDS Sensitivity (at 98 MHz)	$\leq 38.2$ dBf	$\leq 40.2$ dBf

Signal to Noise Ratio (999 kHz, With Antenna Input : 10 mV/m)	$\geq 45$ dB	$\geq 40$ dB
RF Overload 400 Hz		
80% MOD, 100 mV/m Input	$\leq 5\%$	$\leq 10\%$
Search Level (at 999 kHz)	800 $\mu$ V	800 $\mu$ V $\pm 6$ dB
Output Voltage (400 Hz, 30% MOD, 5 mV/m Input)		
	165 mV	$\pm 40$ mV
Whistle	$\leq 10\%$	$\leq 15\%$

#### ● AM SECTION

	Nominal	Limit
Tuning Cover Range 9, kHz Step		
Low	522 kHz	
High	1611 kHz	
Usable Sensitivity (400 Hz, 30% MOD, S/N : 20 dB)	$\leq 500$ $\mu$ V/m	$\leq 1000$ $\mu$ V/m
Image Rejection (at 1404 kHz)	$\geq 35$ dB	$\geq 30$ dB
IF Rejection (at 594 kHz)	$\geq 60$ dB	$\geq 50$ dB
AGC Figure of Merit (From 100 mV/m at 999 kHz)	$\geq 50$ dB	$\geq 45$ dB
Distortion (400 Hz, 30% MOD, 5 mV/m Input)	$\leq 0.8\%$	$\leq 1.5\%$
IF Bandwidth (6 dB Down, 350 $\mu$ V/m)	6 kHz	4-11 kHz
Audio Response, -6 dB (5 mV/m Input, 1 kHz, 0 dB, 999 kHz)	80 Hz-2.3 kHz	100 kHz-2 kHz
Selecticity 350 $\mu$ V/m $\pm 9$ kHz	$\geq 35$ dB	$\geq 25$ dB

**Note :** Nominal spesces represent the design specs. All units should be able to approximate these. Some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable ; in no case should a unit fail to meet limit specs.

This manual is based on the Europe Standard wiring diagram, and information on regional component variations through use of parts list. Design and specifications are subject to change without notice for improvement.

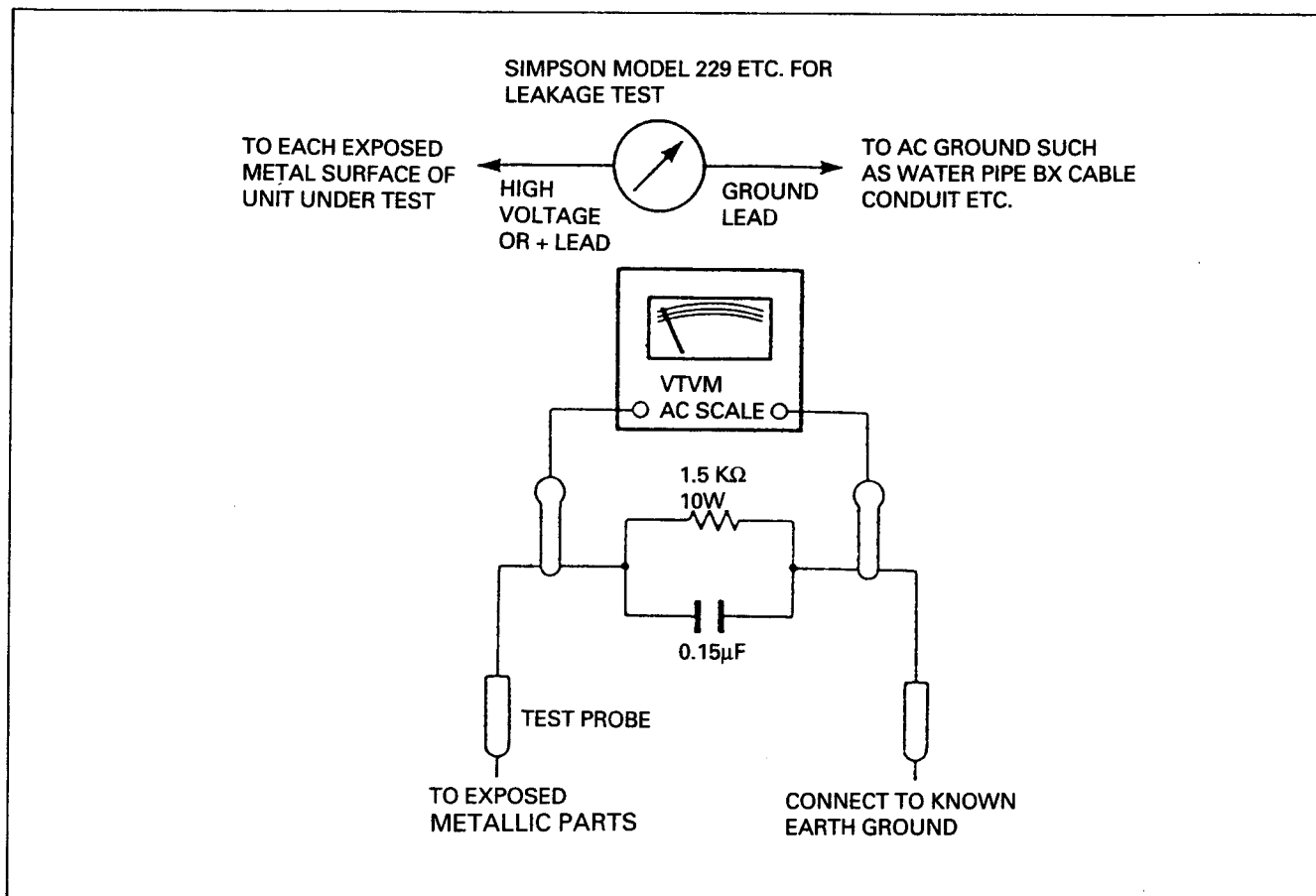
## LEAKAGE TEST

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metallic parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. Which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows: Plug the power cord directly into a 230-volt AC receptacle (do not use an Isolation Transformer for this test).

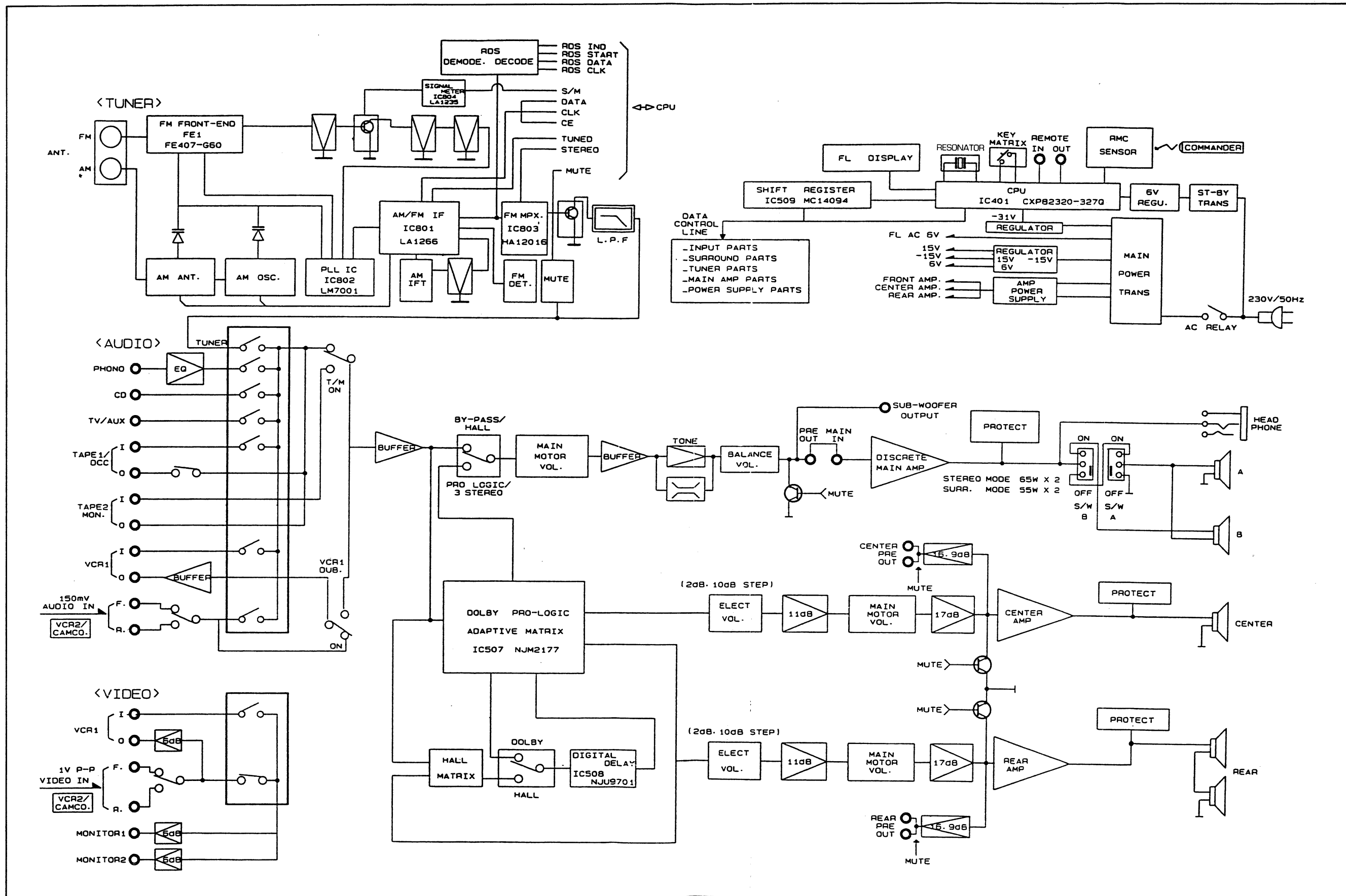
Using two clip leads, connects a 1500 Ohm, 10-watt resistor paralleled by a 0.15 $\mu$ F capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)

A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.

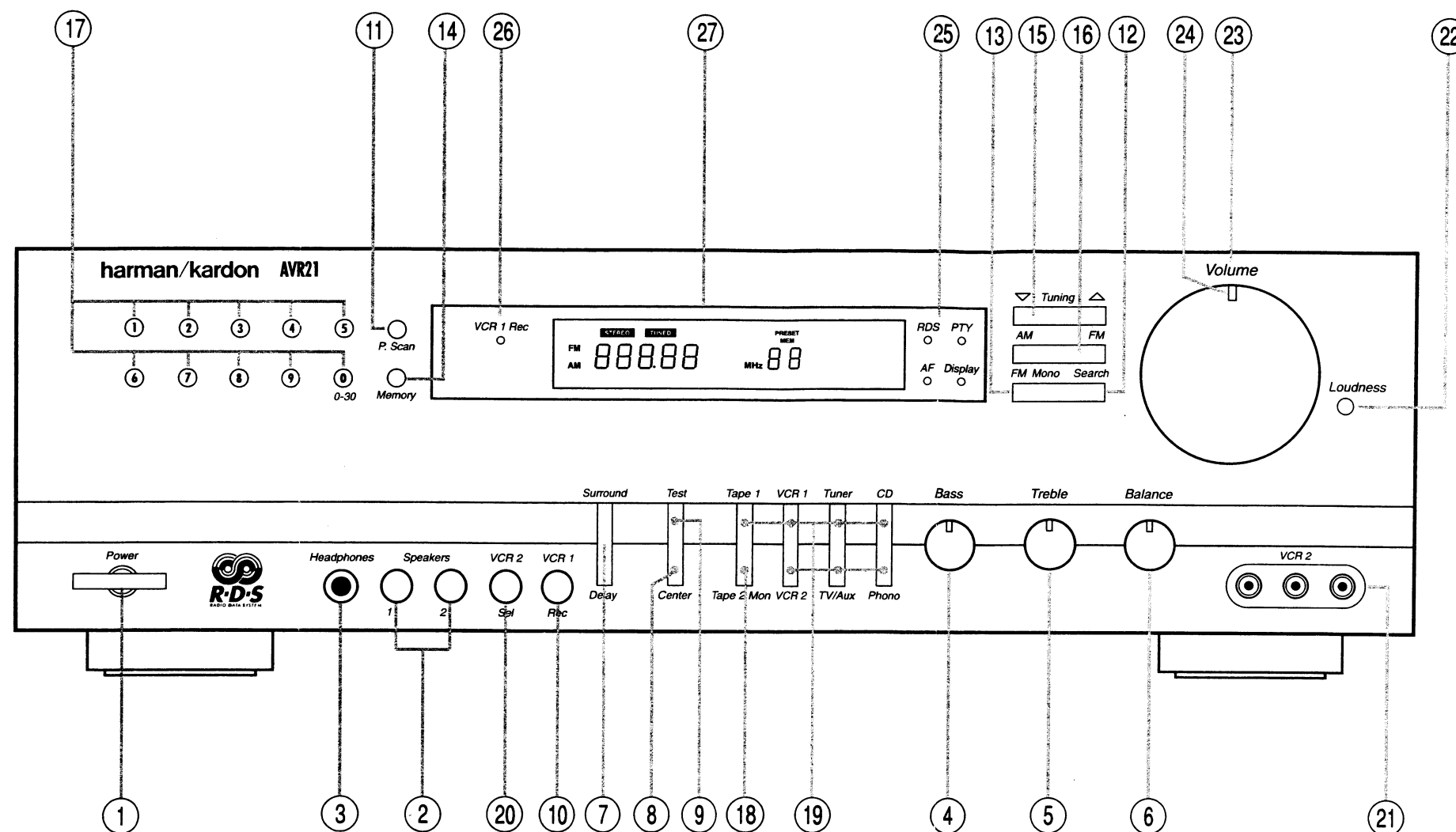




# BLOCK DIAGRAM



## CONTROLS AND FUNCTIONS

**1. POWER BUTTON**

Press this button to turn the power on. Press again to turn the power off.

**NOTE:** In POWER OFF state, the STAND BY indicator will light up amber and power is partially supplied to the infrared remote control receiver and the memory circuitry.

**2. 1/2 SPEAKER SWITCHES**

These switches allow you to select various combinations of speakers as follows;

- To drive 1 pair of speakers, push only the speaker 1 switch in.
- To drive a second pair of speakers, push only the speaker 2 switch in.

- To drive both pairs of speakers, push both 1 and 2 switches in.

- To use headphones for private listening or monitoring, leave both 1 and 2 switches pushed out.

**NOTE:** If both speaker switches are pushed in and only one set of speakers is connected to the receiver, no sound will be heard.

**3. HEADPHONE JACK**

Stereo headphones can be plugged into this jack for private listening. Headphone impedance should be between 8 and 2K ohms. Best results between 200 and 400 ohms.

**4. BASS CONTROL**

Modifies the low-frequency sound of the left and right channels as much as +/- 10dB. Set this control at a suitable position for your taste and room acoustics.

**5. TREBLE CONTROL**

Modifies the high-frequency sound of the left and right channels as much as +/- 10dB. Set this control at a suitable position for your taste and room acoustics.

**6. BALANCE CONTROL**

This control is used for balancing the relative sound volume of the left and right channel speakers. Clockwise rotation reduces the volume from the left speaker, counterclockwise rotation reduces the volume from the right speaker.

**7. SURROUND MODE SELECTOR**

Press this switch to select the desired surround mode. The mode is changed as below, when it is pressed in succession.

→ DOLBY PRO LOGIC → DOLBY 3 STEREO → HALL → OFF

**8. CENTER MODE SELECTOR**

This button operates only in Dolby Pro Logic and Dolby 3 Stereo mode. The mode changes as below when the button is pressed in succession.

**DOLBY PRO-LOGIC MODE**

→ NORM → WIDE → PHANTOM →

**DOLBY 3 STEREO MODE**

→ NORM → WIDE

The display window shows each mode.

**NORM:** Select this mode if you use a small center speaker. The bass sound of the center channel is reproduced from the front speakers because a small speaker cannot produce enough bass.

**WIDE:** Select this mode if you use a medium-to-large center speaker. The bass sound is reproduced from the center speaker.

**PHANTOM:** Select this mode if you are not using a center speaker. The center speaker's sound is reproduced from the front speakers.

**9. TEST TONE BUTTON**

This button operates only in DOLBY PRO-LOGIC and DOLBY 3 STEREO mode. When the button is pressed, 2 seconds of test tone are generated in all channels being tested. In DOLBY PRO-LOGIC mode, front left, center, front right and rear are tested, the display window shows TEST-FL, C, FR and R in succession. In DOLBY 3 STEREO mode, front left, center and front right are tested. The display window shows TEST-FL, C and FR in succession. Use this button to test speaker connections.

## 10. VCR 1 REC

Press the VCR 2 button and VCR1 REC button. Set the recording VCR (VCR 1) to recording mode. Set the playback VCR (VCR 2) to playback mode.

Dubbing will start.

- To hear another input source during video tape dubbing, press the input function you want to hear and play the input source.

## 11. PRESET SCAN BUTTON

Press this button to scan the preset station frequencies. The receiver stops for about 5 seconds at each preset location that contains a frequency so that you can hear a station. The preset indicator, "PRESET" blinks 5 times. Press this button again to stop scanning.

## 12. SEARCH SELECTOR

Press this button to select AUTO or MANUAL tuning.

In AUTO mode scanning is automatically continued up or down until the next station is picked up by pressing the (▼ or ▲) tuning button. The display window shows 'AUTO'. Use this mode to quickly find strong AM or FM stations.

In MANUAL mode the frequency is changed by a step with the (▼ or ▲) button. If you keep pressing the (▼ or ▲) tuning button, scanning is continued until the button is released.

**NOTE:** Tuning Intervals:

BAND	Europe/Australia
FM	50 KHz
AM	9 KHz

## 13. FM MODE BUTTON

Press this button to select stereo or mono mode.

- **STEREO:** Provides stereophonic reception of an FM stereo broadcast. The display window shows 'STEREO'.
- **MONO:** The left and right channel signals detected from an FM stereo broadcast are mixed and reproduced through both channels. If you want to find a weak FM station, select this mode.

## 14. STATION MEMORY BUTTON

Use this button to store an AM or FM frequency. Press this button and select one of 30 preset locations to store the frequency with the STATION PRESET buttons while the memory indicator, 'MEM' blinks.

**NOTE:** When you store a frequency in a memory location that already contains a frequency, you replace the previous frequency. If your receiver is disconnected from AC power for more than about 10 days, it loses all stored frequencies.

## 15. UP/DOWN TUNING BUTTONS

Press the DOWN button (▼) to tune in lower frequency stations, the UP button (▲) to tune in higher frequency stations. If you press the (▼) button when the display is at the bottom of the frequency range, the display returns to the top of the range. If you press the (▲) button when the display is at the top of the frequency range, the display returns to the bottom of the range. When the receiver finds a strong frequency, the display window shows 'TUNED'.

## 16. FM/AM BAND SELECTOR

Press these buttons to select the FM or AM radio band. When you select the AM or FM radio band, the receiver displays the last frequency selected on that band.

## 17. STATION PRESET BUTTONS

Select one of 30 preset locations to recall the station stored in memory. The input function is automatically changed to TUNER when the button is pressed. When you select numbers from 10 through 29, you must select the second digit within about 2 seconds. To select preset 30, simply press "0".

## 18. TAPE 2 MONITOR BUTTON

Set TAPE 2 MONITOR to the "off" position when you want to hear the other input functions. Press this button to monitor the cassette deck connected to the TAPE 2 MON input jacks.

## 19. INPUT FUNCTION SELECTOR

Press the button to select the desired input function: VCR 1, VCR 2, TAPE 1, TV/Aux, Tuner, CD or Phono.

## 20. VCR 2 SELECTOR

Push in this button to select the VCR 2 jacks on the front, rather than the VCR 2 jacks on the rear.

## 21. VCR 2/CAMCORDER INPUT JACKS

### VIDEO IN:

Connect to the VIDEO OUTPUT jack of a VCR (Yellow jack).

### AUDIO IN:

Connect to the AUDIO OUTPUT jacks of a VCR (Red and White jacks).

## 22. LOUDNESS BUTTON

Press this button to compensate for the response of the human ear at low listening levels (known as the Fletcher-Munson hearing curve). The high and low frequencies are automatically boosted when this button is pushed in. In the OFF position the frequency response is flat at all volume levels. This button does not work at high volume levels.

## 23. VOLUME CONTROL

Turn the VOLUME clockwise to increase the volume and counterclockwise to decrease it. The volume of the front, center, and rear channels is changed at the same time.

## 24. VOLUME LEVEL INDICATOR

This indicator moves in accordance with the volume level. The indicator blinks when the mute button on the remote commander is pressed.

## 25. RDS FUNCTION BUTTONS

These buttons are used to access various RDS functions.

## 26. VCR 1 REC INDICATOR

LED indicates when VCR 1 REC button has been pressed and VCR to VCR tape dubbing is engaged.

## 27. DISPLAY

This window shows the state of operation for easier control of the receiver.

## DISASSEMBLY PROCEDURES

### 1 Cover Top Removal (Figure 1)

1. Remove 6 screws (① to ⑥) from the both sides of chassis.
2. Remove 2 screws (⑦ and ⑧) from the chassis back.
3. Carefully lift the cover top to remove.

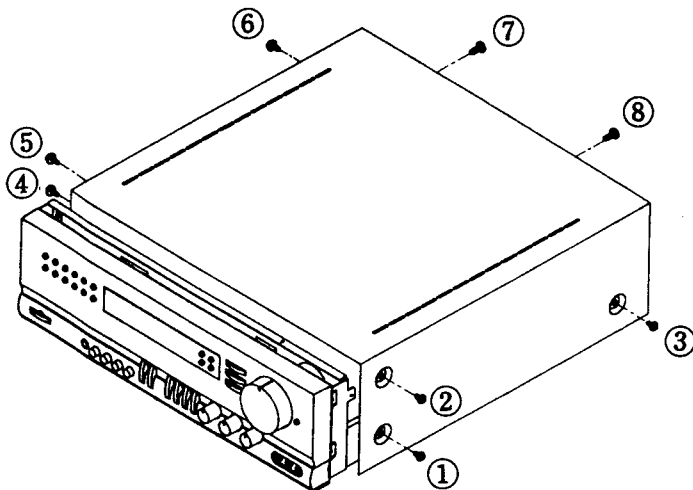


Figure 1

### 2 Cover Bottom Removal (Figure 2)

1. Remove 10 screws (① to ⑩) from the cover bottom.
2. Carefully lift the cover bottom to remove.

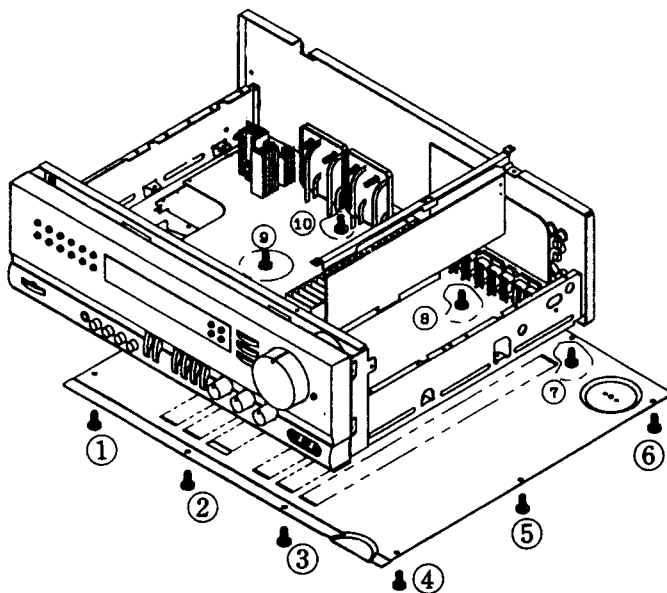


Figure 2

### 3 Panel Front Assembly Removal (Figure 3)

1. Remove the cover top (Refer to step 1)
2. Remove 4 screws (① to ④) from both sides of the panel front.
3. Remove a screw (⑤) from the top of the panel front.

4. Remove 3 screws (⑥ to ⑧) from the bottom of the Panel front.
5. Remove a screw (⑨) from the Volume PC Board.
6. Disconnect CP102, from the Volume PC Board.
7. Disconnect CP403, from the Tuner PC Board.
8. Disconnect CP602 from the Surround PC Board.
9. Disconnect CP701, CP702, CP401 (Card cable) from the Input PC Board.
10. Disconnect CP902, CP402, CP901 from the Main PC Board.
11. Disconnect CP703 from the Video PC Board.

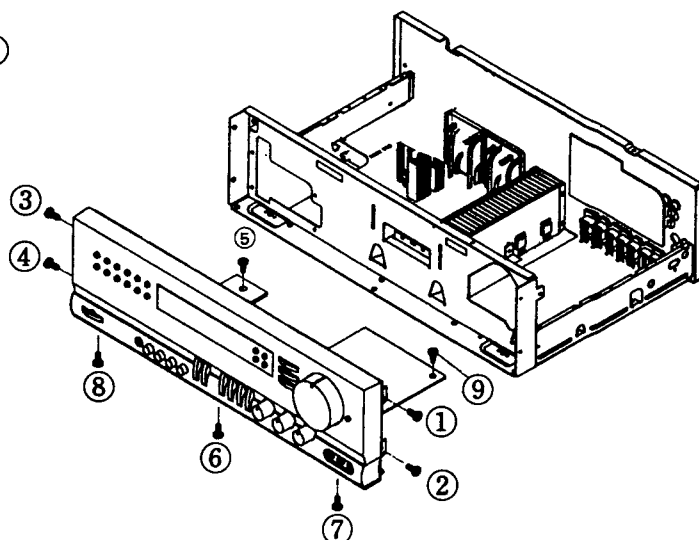


Figure 3

### 4 Volume PC Board Removal (Figure 4)

1. Remove the panel front assembly. (Refer to step 3).
2. Disconnect CP603 from the Volume PC Board.
3. Pull the knob (main volume).
4. Remove the hex nut from the volume motor.
5. Remove 2 screws (① to ②) from loud switch.
6. Pull the Volume P.C Board from the panel front assembly to remove.

### 5 Tone P.C Board Removal (Figure 4)

1. Remove the panel front assembly (Refer to step 3)
2. Pull out the knobs (bass, treble, balance) from the panel front assembly.
3. Remove the hex nuts from the variable resistors.
4. Remove 4 screws (③ and ⑥) from the Tone P.C Board.

**[6] Front P.C Board Removal (Figure 4)**

1. Remove the panel front assembly. (Refer to step [3]).
2. Remove 11 screws (⑦ from ⑰) to release the panel front.

**[7] Speaker P.C Board Removal (Figure 4)**

1. Remove the panel front assembly (Refer to step [3])
2. Remove 4 screws (⑱ and ⑳) from the panel front to release the Speaker P.C Board.

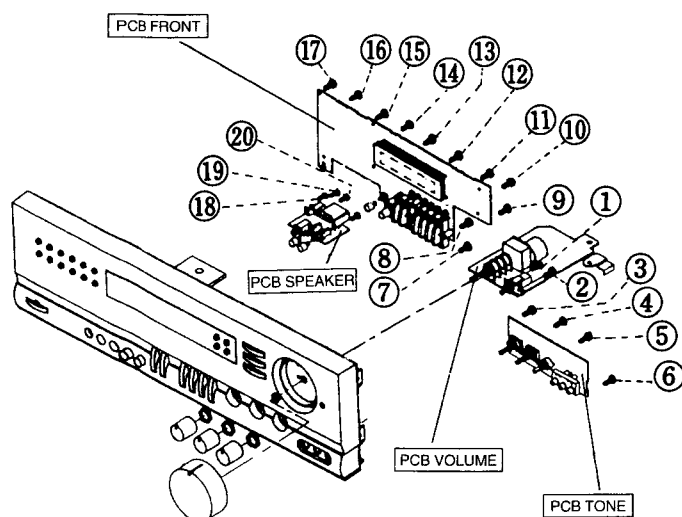


Figure 4

**[8] Tuner P.C Board Removal (Figure 5)**

1. Remove the cover top (Refer to step [I])
2. Remove a screw ① from the Tuner P.C Board bracket.
3. Disconnect CP403 from the Tuner P.C Board.
4. Remove 2 screws (② and ③) from the chassis back.
5. Remove the Tuner P.C Board.

**[9] Surround P.C Board Removal (Figure 5)**

1. Remove the cover top (Refer to step [I])
2. Disconnect CNT602 from the Surround P.C Board.
3. Remove 2 screws (④ and ⑤) from the chassis back and chassis front.
4. Remove the Surround P.C Board.

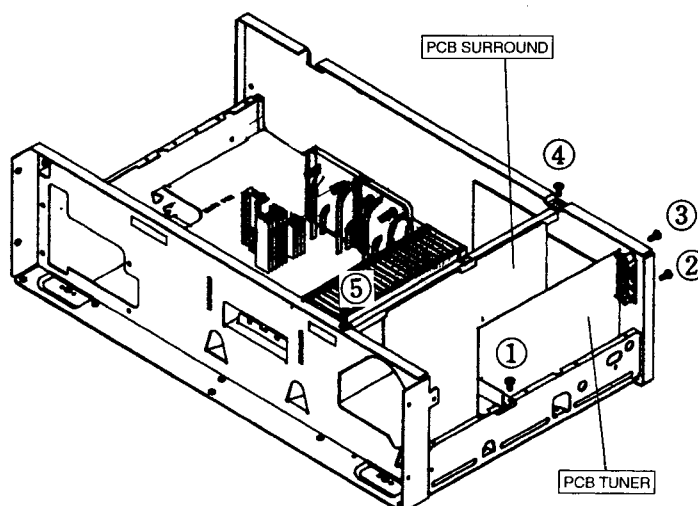


Figure 5

**[10] Video P.C Board Removal (Figure 6)**

1. Remove the cover top (Refer to step [I])
2. Do steps [8], [9]
3. Disconnect CP703, CP101, CP104 from the Video P.C Board.
4. Disconnect CP302 from the Subwoofer P.C Board.
5. Disconnect CP301 from the Main P.C Board.
6. Remove 5 screws (① to ⑤) from the chassis back.

**[II] Sub woofer P.C Board Removal (Figure 6)**

1. Remove the cover top (Refer to step [I])
2. Disconnect CP302, CP110 from the Sub woofer P.C Board.
3. Remove 4 screws (⑥ to ⑨) from the chassis back.

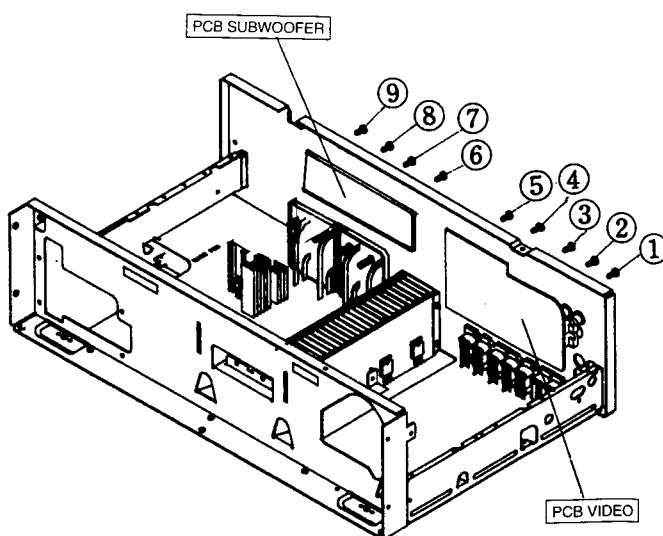
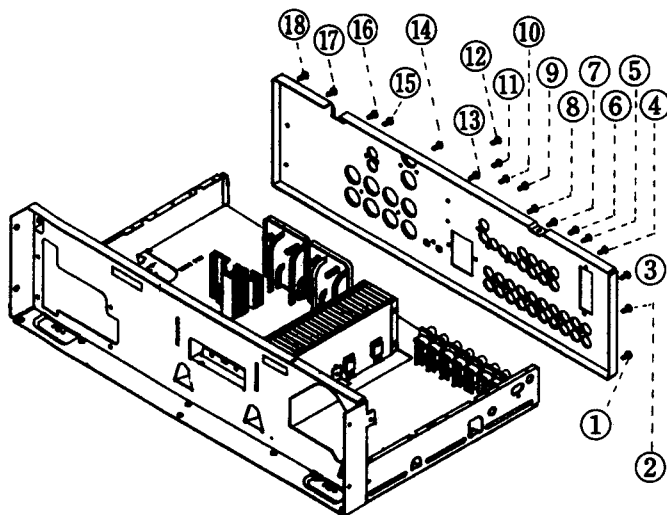


Figure 6

**12 Chassis Back Removal (Figure 7)**

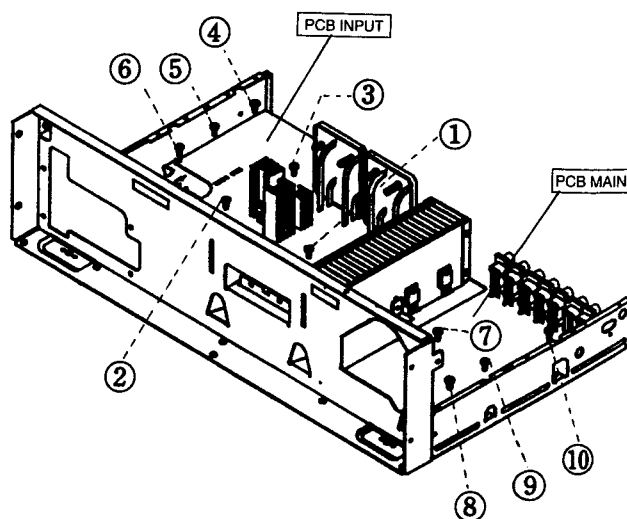
1. Remove the cover top (Refer to step 1).
2. Do steps 2, 8, 9, 10 and 11.
3. Remove 18 screws (1 and 18) from the chassis back.

**Figure 7****13 Main P.C Board Removal (Figure 8)**

1. Remove the cover top (Refer to step 1).
2. Do steps 2, 3, 8, 9, 10 and 12.
3. Disconnect CP109, CP103, CP205, CP203, CP201 CP202, CP207T, CP207H from the Main P.C Board.
4. Disconnect CP204, CP207 from the Input P.C Board.
5. Unsolder P1, P2(cord AC) from the Main P.C Board.
6. Unsolder all leads of Q217L/R, Q213L/R, Q216L/R in the Main P.C Board bottom.
7. Remove 6 screws (1 to 6) from the Main P.C Board top to release the Main P.C Board.

**14 Input P.C Board Removal (Figure 8)**

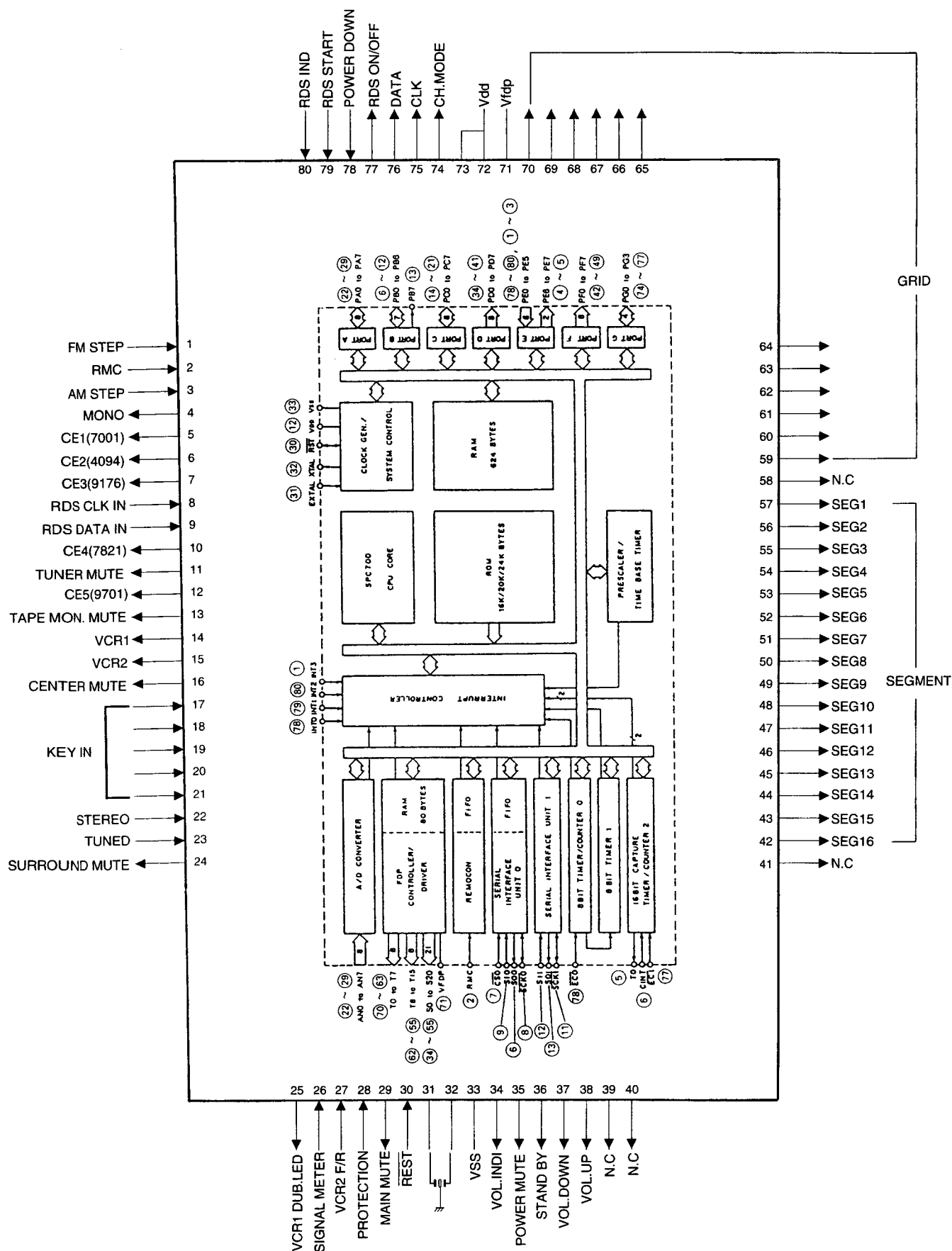
1. Remove the cover top (Refer to step 1).
2. Do steps 2, 3, 8, 9, 10, and 12.
3. Disconnect CP204, CP207 from the Input P.C Board.
4. Disconnect CP109 from the Main P.C Board.
5. Unsolder all leads of Q116, Q112, Q115, Q126, Q123, Q127 in the Input P.C Board bottom.
6. Remove 4 screws (7 to 10) from the Input P.C Board top to release the Input P.C Board.

**Figure 8**

# CIRCUIT DESCRIPTION

## CPU(IC401) : CXP82320-327Q

### 1. Pin Description & Block Diagram



## 2. Input and Output Terminal Functions

Pin No.	Symbol	Description															
1, 3	STEP	<p>Input to select frequency band &amp; step according to regions.</p> <table><tr><th>REGION</th><th>FREQUENCY</th><th>STEP</th><th>FSTEP</th><th>ASTEP</th></tr><tr><td>AMERICA</td><td>FM: 87.5 - 107.9 MHz AM: 520 -1710 kHz</td><td>200 kHz 10 kHz</td><td>H</td><td>H</td></tr><tr><td>EUROPE</td><td>FM: 87.5 - 108 MHz AM: 522 -1611 kHz</td><td>50 kHz 9 kHz</td><td>L</td><td>L</td></tr></table>	REGION	FREQUENCY	STEP	FSTEP	ASTEP	AMERICA	FM: 87.5 - 107.9 MHz AM: 520 -1710 kHz	200 kHz 10 kHz	H	H	EUROPE	FM: 87.5 - 108 MHz AM: 522 -1611 kHz	50 kHz 9 kHz	L	L
REGION	FREQUENCY	STEP	FSTEP	ASTEP													
AMERICA	FM: 87.5 - 107.9 MHz AM: 520 -1710 kHz	200 kHz 10 kHz	H	H													
EUROPE	FM: 87.5 - 108 MHz AM: 522 -1611 kHz	50 kHz 9 kHz	L	L													
2	RMC	Input for remote control signal.(At "L", it is active.)															
4	MONO	Output for FM MODE.(At "H", it is active.)															
5	LM7001 STROBE	Output to enable IC LM7001.															
6	MC14094 STROBE	Output to enable IC MC14094.															
7	TC9176 STROBE	Output to enable IC TC9176.															
8, 9	RDS CLK, RDS DATA	Input LC7073 CLK and DATA signal.															
10	LC7821 STROBE	Output to enable IC LC7821.															
11	TUNER MUTE	<p>Output for tuner mute.</p> <p>Output, high level under the following conditions.</p> <ol style="list-style-type: none"><li>1. When power is turned on or off.</li><li>2. When tuner band is changed.</li><li>3. When tuner up or down button is pressed.</li><li>4. When preset button is pressed.</li><li>5. When the preset number displayed changes during memory scan.</li><li>6. When the protection terminal's level is low.</li><li>7. When "-∞ mute signal" is received from the commander.</li><li>8. When AF button is pressed in RDS ON state.</li><li>9. When Searching PTY in RDS ON state.</li></ol>															
12	NJU9701 STROBE	Output to enable IC NJU9701.															
13	TAPE MON. MUTE	Output for TAPE MON. MUTE.															
14, 15	VCR1, VCR2	<p>Output to select the video signal of VCR1 or VCR2.</p> <p>Output data for each mode is as follows.</p> <table><tr><th>MODE</th><th>14</th><th>15</th></tr><tr><td>VCR1</td><td>H</td><td>L</td></tr><tr><td>VCR2</td><td>L</td><td>H</td></tr><tr><td>ELSE</td><td>△</td><td>△</td></tr></table> <p>△: Keeping last state.</p>	MODE	14	15	VCR1	H	L	VCR2	L	H	ELSE	△	△			
MODE	14	15															
VCR1	H	L															
VCR2	L	H															
ELSE	△	△															
16	CENTER MUTE	<p>Output for center mute.</p> <p>Output, high level under the following conditions.</p> <ol style="list-style-type: none"><li>1. When power is turned on or off.</li><li>2. When center mode is turned on or off.</li><li>3. When center mode is switched.</li><li>4. When test tone mode is switched on, or when output is not directed to center.</li><li>5. When the protection terminal's level is low.</li><li>6. When "-∞ mute signal" is received from the commander.</li></ol>															
17-21	KEY INPUT	When receiving low level, it turn on the stereo flag of FL.															
22	STEREO	Receiving low level, it turn on the stereo flag of FL.															
23	TUNED	<p>Input for station detector signal in searching tuning.</p> <p>Searching up or down Stops when station detector reached a certain level.</p>															



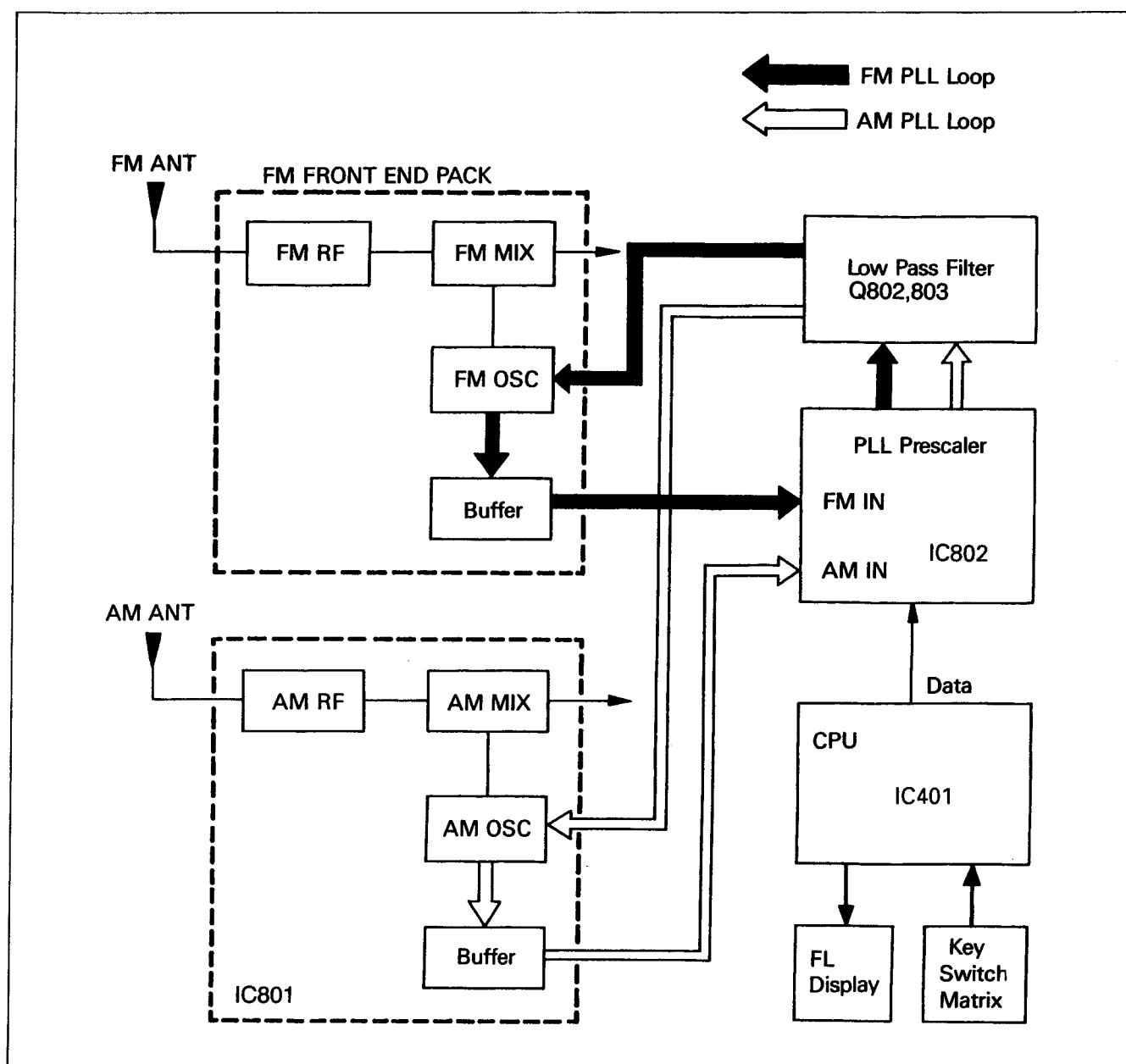
Pin No.	Symbol	Description
24	SURR. MUTE	Output for surround mute. Output, high level under the following conditions. 1. When power is turned on or off. 2. When surround mode is switched. (Keeping high level in surround off.) 3. When test tone mode is changed, or when output is not directed to surround. 4. When delay time is switched. 5. When the protection terminal's level is low. 6. When "-∞ mute signal" is received from the commander.
25	VCR1 DUB. LED	Output voltage to control VCR1 DUB. LED. (At "H", it is active.)
26	SIGNAL METER	Input for FM SIGNAL METER.
27	VCR2 F/R	Switches VCR2 F/R Audio Signal. (L : FRONT, H : REAR)
28	PROTECTION	Input for protection signal. If it is low, all channel mute signal levels are turned to high. Except for first 3 second, it doesn't check protection.
29	MAIN MUTE	Output for main mute. Output, high level under the following conditions. 1. When power is turned on or off. 2. When function is changed. 3. When mono and stereo is changed. 4. When the protection terminal's level is low. 5. When "-∞ mute signal" is received from the commander.
30	RESET	Input to reset micom.
31, 32	EXTAL, XTAL	Input and output pin for connecting a crystal oscillator.
33	VSS	Provides the ground potential.
34	VOL. INDI.	Output signal to turn on or off the LED which is used for master volume indicator. It is high level in turning on and low level in turning off.
35	POWER MUTE	Output for all amp. mute. Output, low level under the following conditions. 1. When power is turned on or off. 2. When the protection terminal's level is low.
36	STAND BY	When power is turned on by power switch or remocon, it is high level. When power is turned off, it is low level. (Keeping last state.)
37, 38	VOL. UP, DOWN	Output signal to turn up or down volume motor. (At "H", it is active.)
39 - 41	NC	Not used !
42 - 57	S16 - S1	Output for segment.
58	NC	Not used !
59 - 70	G1 - G12	Output for grid.
71	Vfdp	Power supply of the FL controller.
72, 73	Vdd	Power supply.
74	CH-MODE	Output voltage as follows to control surround mode. Prologic, Hall: 5 V, 3-Stereo: 2.5 V, OFF: 0 V
75, 76	CLK, DATA	Output clock and data signal to ICs, LC7821, NJM9701, TC9176, MC14094 and LM7001.
77	RDS ON/OFF	Output to reset IC LC7073.
78	PD	Input for power down. (At "L", it is active)
79	RDS START	Input for LC7073 data start.
80	RDS IND	Input for TDA7330B RDS Indication.

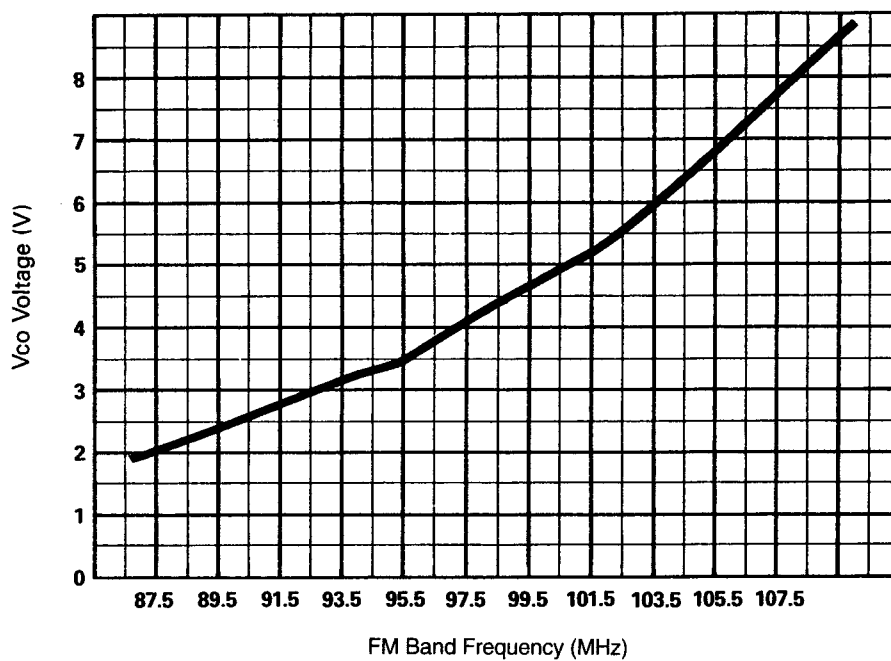
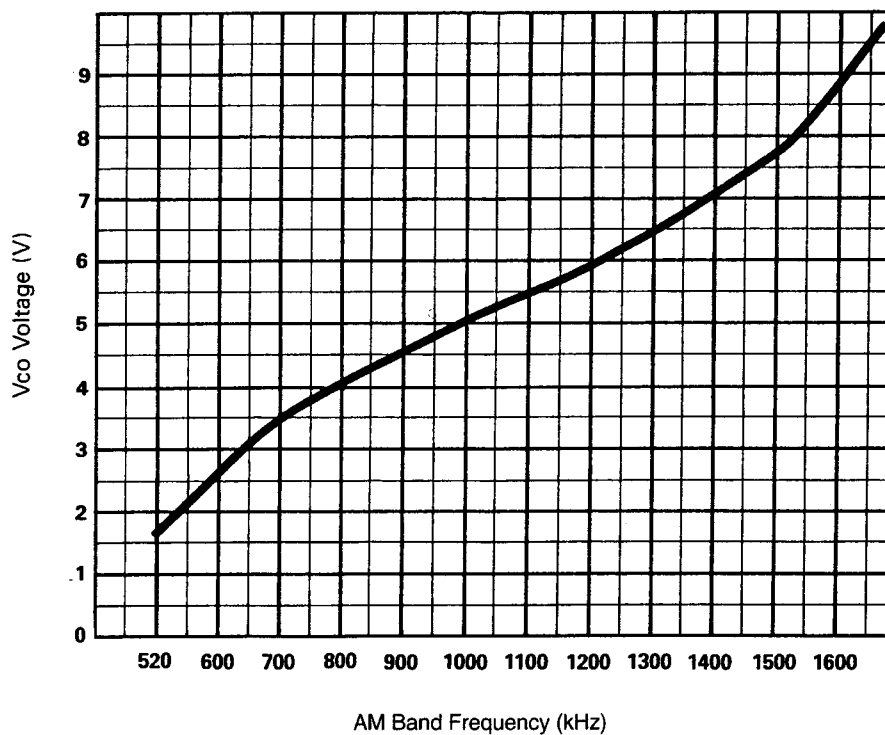
### 3. Key Matrix

PIN NO.	47	48	49	50	51	52	53	54
17	SURR.				FM	AF	CENTER MODE	TEST TONE
18	MEMORY	10	8		AM	DISPLAY	TAPE 2	TAPE 1
19	DELAY TIME	9	7	6	SEARCH	FM MODE	VCR	VCR
20	VCR 1 REC	4	2	1	TUNE	PTY	TV	TUNER
21	P.SCAN	5	3	POWER	TUNE	RDS	PHONO	CD

### 4. Digital Tuning System Description

#### Digital Tuning System



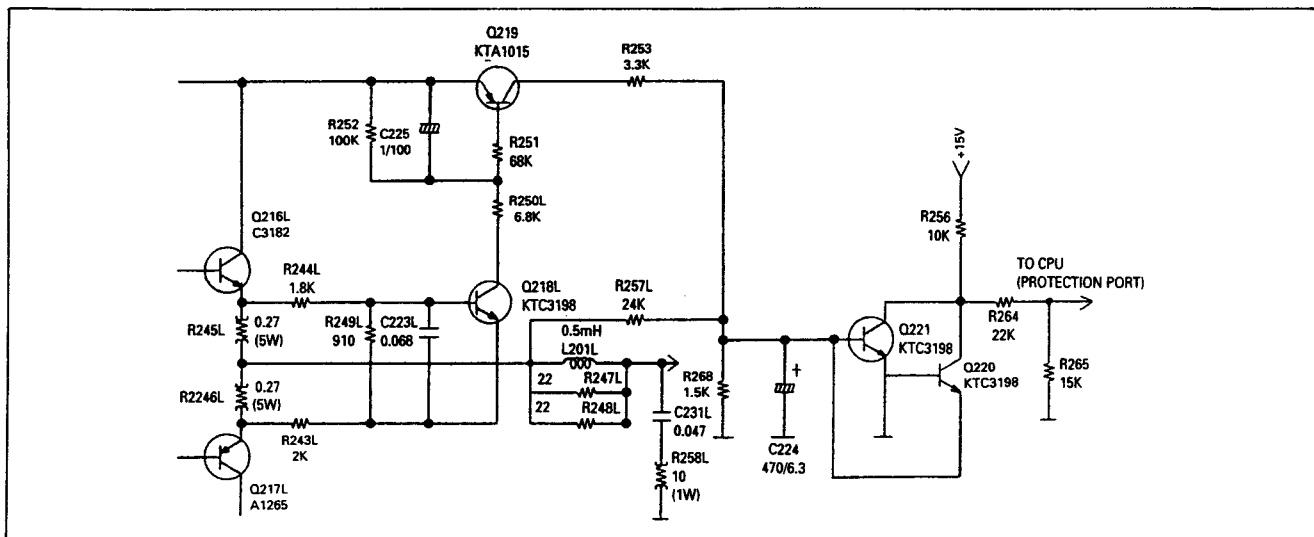
**Vco vs. FM Band Frequency Curve****Vco vs. AM Band Frequency Curve**

## 5. Protection Circuits

### Speaker Protection Circuit

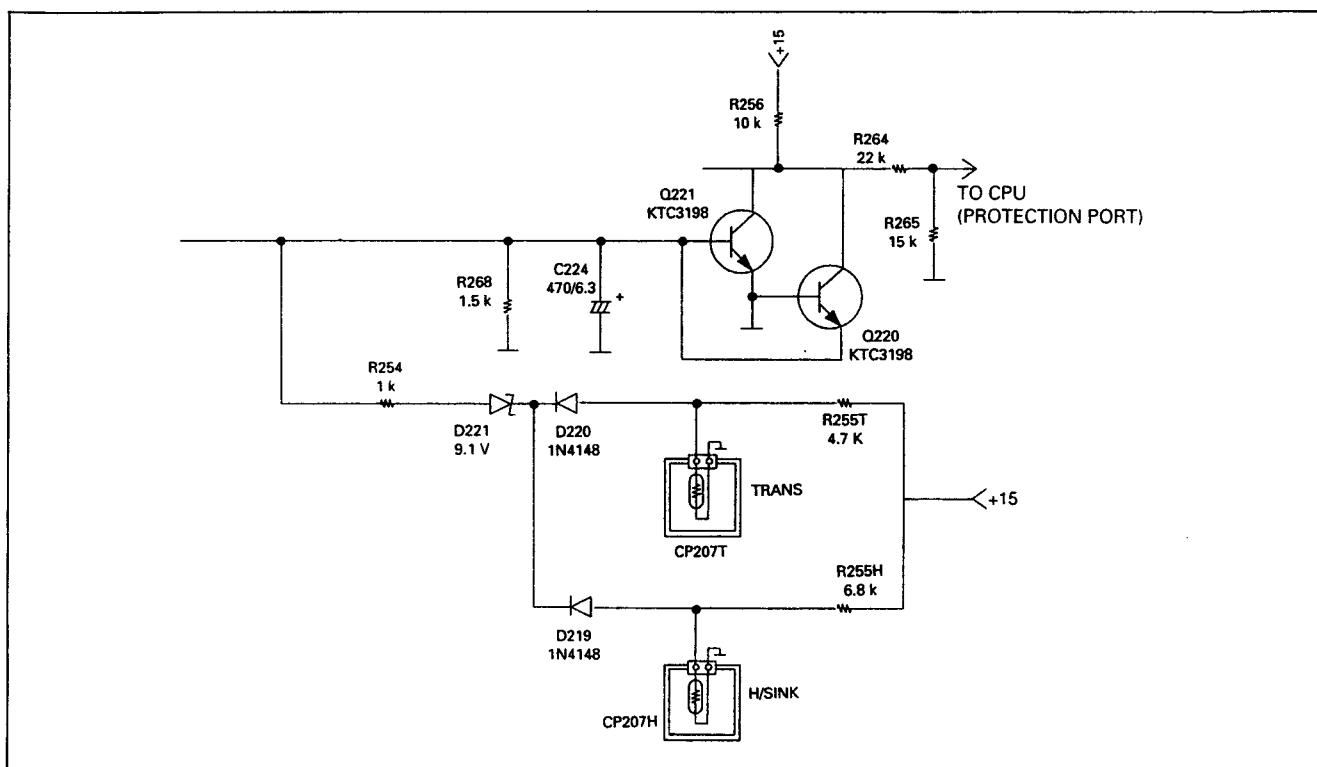
The CPU protects both this unit and the speakers when an abnormally high current flows in Q216 L/R and Q217 L/R due to excessive input drive, too low of a load impedance, or short of the speaker terminals. If current increase is excessive, the voltage across R245 L/R or R246 L/R turns on Q218 L/R, then Q219 turns on Q221.

It makes the protection port of the CPU to low state. Then the power is turned off.



### Thermal Protection Circuit

This receiver has a overload thermal protection circuits to guard against abnormal operation. When the temperature of TRANS POSISTOR installed with the main transformer or H/SINK POSISTOR rises abnormally, the resistance of the posistor becomes larger and Q221 is turned on. It makes the protection port of the CPU to low state. Then the power is turned off.



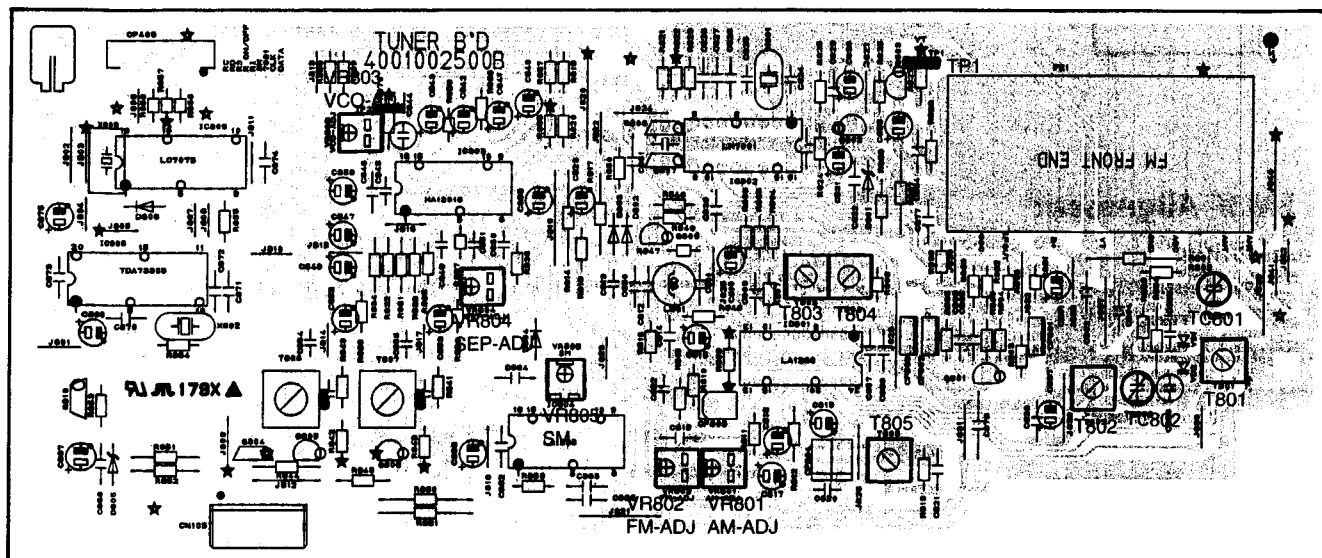
## ALIGNMENT PROCEDURES

### 1. Equipment Required

- AM Standard Signal Generator (AM SSG)
- Oscilloscope
- AC Voltmeter
- FM Standard Signal Generator (FM SSG)
- Stereo Modulator
- Audio Generator
- Distortion Meter
- DC Voltmeter
- Frequency Counter

**Note :** Disconnect external FM antenna prior to alignment.

### 2. Alignment and Test Points (PCB9)

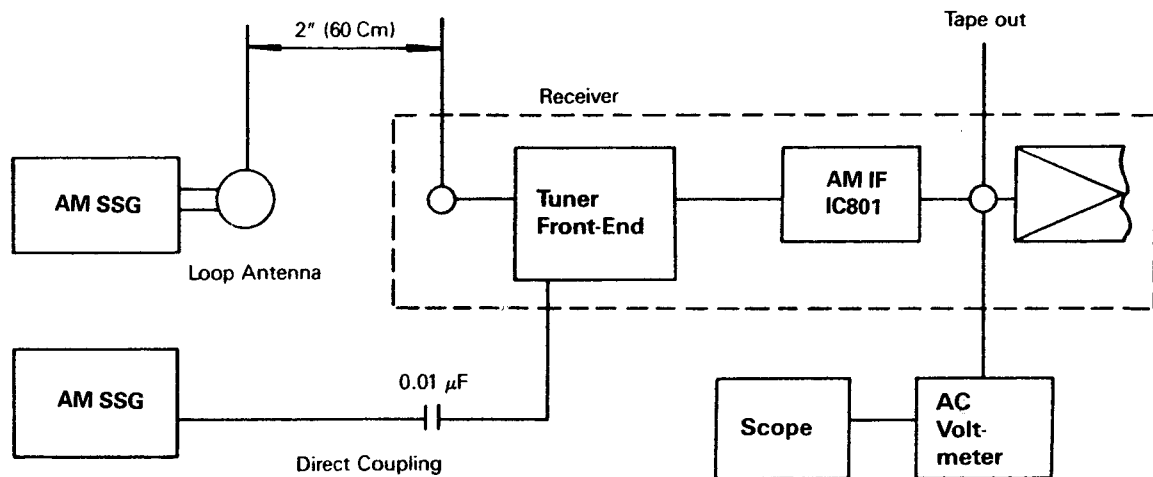


### 3. AM IF and RF Alignment

#### Preparation

1. Output of Signal Generator should not be higher than necessary to obtain an optimum output reading.
2. Signal Generator Modulation: 30%.
3. Switch: Press to AM.

Step	Signal Generator Frequency	Receiver Frequency on the Display	Equipment Connection	Adjustment Point	Adjust for
1	999 kHz (400 Hz, Mod.)	522 kHz	DC Voltmeter TP1	T802	1.2 V reading
		1611 kHz	DC Voltmeter TP1	TC802	8.5 V reading
2	594 kHz (400 Hz, Mod.)	594 kHz	Same as Step 1.	T801 (ANT Coil)	Same as Step 1
3	1404 kHz (400 Hz, Mod.)	1404 kHz	Same as Step 1.	TC801 (ANT Trimmer)	Same as Step 1
4	450 kHz (400 Hz, Mod.)	Place at a non-interference spot around 600 kHz	AC voltmeter to TAPE OUT jack.	T805 (IFT)	Maximum reading
5	999 kHz (400 Hz, Mod.)	999 kHz	Same as Step 1.	VR801	FL display 'TUNED' Indication on receiver with AM SSG Output level of 800 $\mu$ V/m



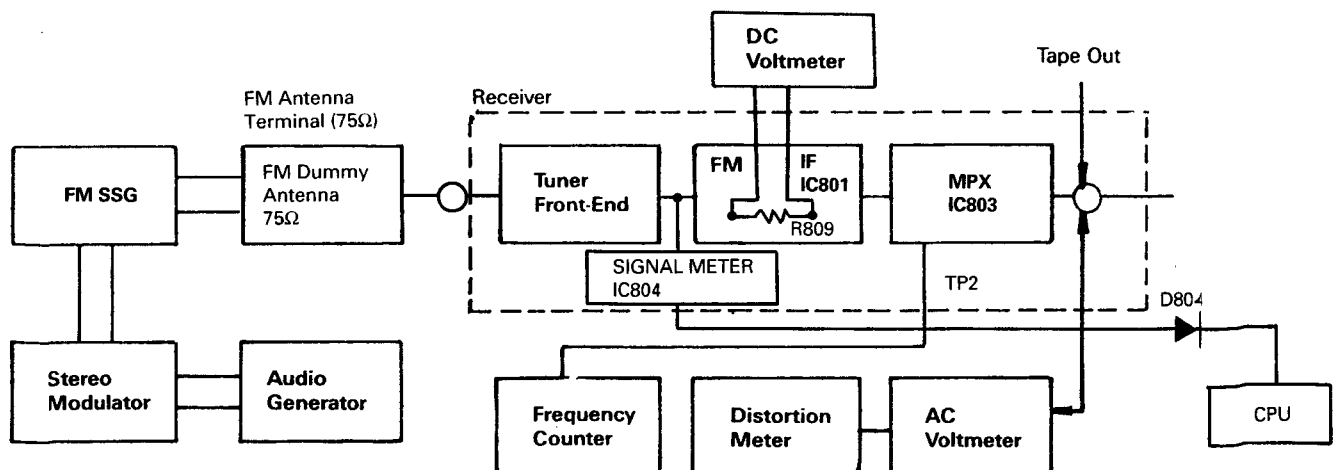
AM Alignment Connection

#### 4. FM IF Alignment

##### Preparation

1. Signal Generator output should be no higher than necessary to obtain an optimum output reading.
2. Switch Press to FM.
3. Signal generator deviation : 40 kHz.

Step	Signal Generator Frequency	Receiver Frequency Display	Equipment Connection	Adjustment Point	Adjust for
1	98.0 MHz (1 kHz, Mod.)	98.0 MHz	Distortion meter to TAPE OUT jack	T804	Minimum distortion
2	98.0 MHz (1 kHz, Mod.)	98.0 MHz	Same as Step 1	VR802	FL display 'TUNED' Indication on receiver with FM SSG output level of 10 $\mu$ V/m
3	98.0 MHz (1 kHz, Mod.)	98.0 MHz	DC Volt meter to R809 (PCB9)	T803	Zero reading on DC volt meter.



FM RF/IF and MPX Alignment Connection

## 5. MPX Alignment, SM Alignment

### Preparation

1. Switch : Press to FM.
2. Tuner for 98 MHz on band.
3. Signal Generator output level : 1000  $\mu$ V.
- 4 Deviation : 40 kHz, at 100% modulation of composite signal.
5. Connect Signal Generator to FM antenna terminal through FM dummy antenna (75  $\Omega$ ).

Step	19 kHz Modulation Level	Signal Generator Frequency Setting	Equipment Connection	Adjustment Point	Adjust for
1	Pilot off	Carrier only	Frequency counter connect to TP2 (HOT) of PCB and ground	VR803	76 kHz
2	8% Mod.	Composite to channel 1kHz R	AC voltmeter to TAPE OUT jack of R channel	–	Adjust for about 450mV of audio output
3	8% Mod.	Composite to channel 1 kHz L	AC voltmeter to TAPE OUT jack of R channel	VR804	AC voltmeter reading should be at least 40 dB below.
4	8% Mod.	Composite to channel 1 kHz R	AC voltmeter to TAPE OUT jack of L channel	VR804	Same as Step 3.
5	8% Mod.	Composite to channel 1 kHz L or R	AC voltmeter to TAPE OUT jack Lor R channel	VR805	FL display 'SIG 60 dB' indication on receiver with FM SSG output lenel of 1000 $\mu$ V/m
If you could not obtain –40dB readings in Steps 3 and 4 (compared with Step 2), readjust VR804 until you obtain –40dB readings for both Steps 3 and 4. Nominal is –45 dB.					

## TROUBLESHOOTING

Symptom	Cause and Remedy
Receiver inoperative (FL indicator does not light)	A) Faulty AC power cord. Replace. B) Defective the power switch. Replace. C) Broken wire in the power transformer. Replace the power transformer. D) Blown fuse. Replace the fuse.
Fuse blows when power is turned on.	A) Defective power transformer. Replace. B) Short on the primary or secondary of the transformer circuitry. Repair the trace. C) Damaged rectifier (D208 to D211) or damaged transistor (Q216 to Q217). Replace the defective component(s). D) Short circuit in the amplifier circuit. Replace the shorted component(s) in the amplifier circuit.
Power indicator lights but no sound from both channels	A) Speaker switch 1 or 2 defective. Replace the defective switch (es) B) Defect in transistor Q216 L/R, Q217 L/R on the Main Amp Board. Replace the defective component(s).
Speaker A inoperative	A) Speaker switch A defective. Replace
Speaker B inoperative	A) Speaker switch B defective. Replace.
One channel does not work when Volume is at maximum with a test signal applied to the center terminal of Volume control VR5 of the dead channel	A) Defect in transistor Q216 L/R, Q217 L/R on the Main Amp Board Locate and correct the defect. B) Break in copper foil of printed circuit board. Repair the circuit trace. C) Short in speaker output terminal. Repair or replace.
Speaker works normally but headphones inoperative	A) Headphone plug does not mate with jack. Replace the jack. B) Defective resistor R901, R902. Replace.
PHONO input inoperative	A) Poor contact in phono input jack. Repair or replace the jack. B) Defective phono switch or IC103. Replace.
LOUDNESS has no effect	A) Defective loudness switch. Replace. B) Defective resistor R601, R602, C601, C602. Replace the defective components(s).
FM inoperative	A) Defective front-end. (FE407-G60) Replace. B) Defective FM switch. Replace the switch



Symptom	Cause and Remedy
FM inoperative	<p>C) Defective transistor Q801, Q805, Q806, IC801, IC803 Replace the defective transistor(s) or IC(s).</p> <p>D) Defective coil T803 or T804 Replace the coil(s).</p> <p>E) Defective lead-in. Repair or replace the lead-in.</p> <p>F) Ceramic filter CF801, CF802, CF803 defective. Replace the defective ceramic filter(s).</p> <p>G) Defective controller circuit component. Replace.</p>
Poor multiplex separation	<p>A) Improper adjustment. Readjust VR803 and VR804. (Refer to MPX Alignment.)</p> <p>B) IC803 defective. Replace.</p> <p>C) Variable resistor VR803 or VR804 defective. Replace the variable resistor(s).</p>
STEREO indicator does not light	<p>A) Defective indicator in FL. Replace.</p> <p>B) Improper adjustment of VR803 of tuner board. Make readjustment.</p> <p>C) Defective IC803 Replace the defective component.</p>
FM volume not sufficient	<p>A) If volume from both L and R channels is not loud enough : Front end Section defective. Faulty IC801, Coil T803, Defective C838 of tuner Board. If sound of one channel is not loud enough: Defective T806, T807</p>
FM Mono has no effect	<p>A) Defective FM MODE switch. Replace.</p>
AM inoperative	<p>A) Damaged IC801 of tuner board. Replace.</p> <p>B) Defective T801, T802, T805 or CF804 of tuner board. Replace the defective component(s).</p> <p>C) Resistor R829, R817 defective. Replace the defective component(s).</p> <p>D) Capacitor C836, C818, C813 defective. Replace the defective capacitor(s).</p> <p>E) Defective AM switch Replace.</p> <p>F) Defective varicap diode VD1, VD2 Replace varicap diodes(s).</p> <p>G) Damaged AM loop antenna. Repair or replace.</p> <p>H) Defective controller circuit component. Replace.</p>
Bass control has no effect	<p>A) Variable resistor BASS defective. Replace.</p> <p>B) Defective R709L/R, R710L/R, C702L/R, C708L/R Replace the defective component(s).</p>

Symptom	Cause and Remedy
Treble control has no effect	A) Variable resistor TREBLE defective. B) Defective R711 L/R, R712 L/R, C709 L/R, C710L/R Replace the defective components(s).
Auto tune inoperative (UP/DOWN)	A) Poor contact in Up/Down key. Repair or replace. B) Defective IC401 Replace. C) Defective FL401. Replace. D) Defective tuner circuit component. Replace. E) In case of FM only, improper adjustment of FM front-end. Readjust.
Manual tune inoperative (UP/DOWN) (AM or FM)	A) Poor contact in Up/Down key. Replace. B) Defective IC401. Replace.
Memory setting (keys 1-10) inoperative	A) Poor contact in memory keys 1-10. Replace. B) Poor contact in memory set key. Replace. C) Defective IC401. Replace the defective component.
FL inoperative	A) FL defective. Replace. B) Defective IC401. Replace. C) Defective X401. Replace.
Noise Volume control	A) Defective IC603. Replace. B) Defective capacitor C615 or C616. Replace the defective capacitor(s).
Remote Control Unit inoperative	A) Weak Battery. Replace. B) Defective. Replace. C) Defective IC401(CPU Board) or IC01. Replace.

## GENERAL UNIT PARTS LIST

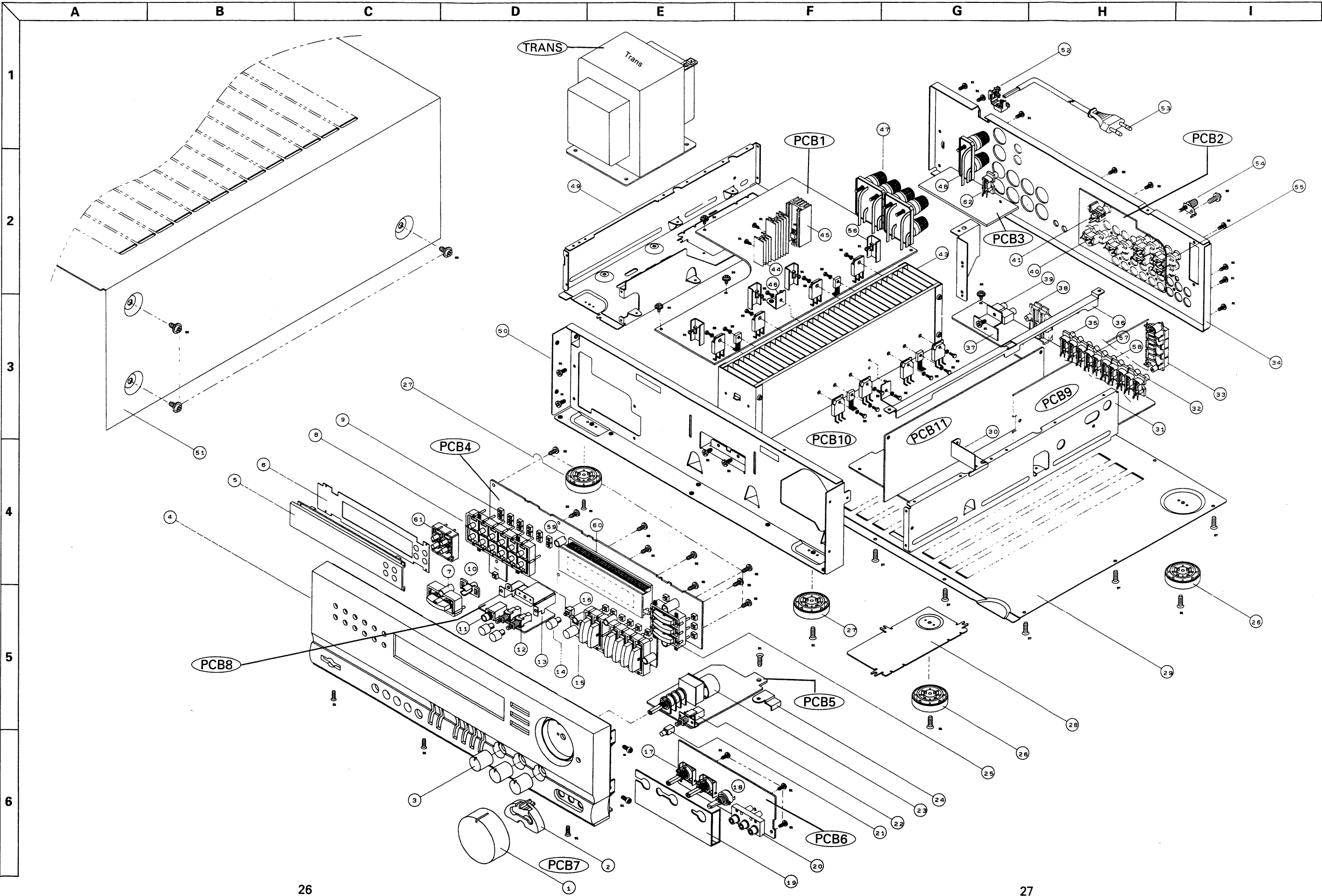
Ref. No.	Description	Mfr. Part No.	Q'ty
<b>CABINET &amp; CHASSIS</b>			
1	Knob, Volume, ABS, Black	048543059811	1
2	Indicator, Volume	8555048610	2
3	Knob, Rotary	048545124311	3
4	Panel, Front, ABS, Black	048501033813	1
5	Window, Display	048553023211	1
6	Filter	048555052011	1
7	Button, Power, ABS, Black	048545124011	1
8	Button, Preset, ABS, Black	048543059611	1
9	Switch, Tact	4658003710	31
10	Indicator, Power	8555048710	1
11	jack, Phone	4438005020	1
12	Switch, Push, ABS, Black	4628043810	2
13	Shield Fence	6165147910	1
14	Button, Speaker, ABS, Black	048545124111	1
15	Button, Function, ABS, Black	048543059911	1
16	Switch, Push, 1key, ABS, Black	4628054410	1
17	Volume, Bass/Treble	3208049510	2
18	Volume, Balance	3208052010	1
19	Shield Fence	6165148420	1
20	Jack, RCA, 3P, VCR	4438109710	1
21	Button, Loud, ABS, Black	048545124211	1
22	Switch, Push, Loud	4628059610	1
23	Volume, Motor	3228019410	1
24	Bracket, Volume	6505138410	1
25	Button, Tuning, ABS, Black	048543059711	1
26	Foot, ABS, Black	6033102510	2
27	Foot, Hot-stamping, Gold	046033102511	2
28	Frame, Cover	6123205210	1
29	Cover, Bottom, SECC	6122418120	1
30	Bracket, PCB	6505142010	1
31	Frame, Right	6122636410	1
32	Jack, RCA, 4P	4438108110	1
33	Terminal, Antenna	4408108210	1
34	Chassis, Back, SECC	046102011252	1
35	Jack, RCA, 6P	4438103210	1
36	Frame, Center	6123205110	1
37	Bracket, Jack	6505138510	1
38	Terminal, Speaker, 6P	4408106410	1
39	jack, Multi	4438006510	1
40	Jack, RCA, 2P with Ground	4438109310	1
41	Jack, RCA, 1P, Yellow	4438113810	1
42	Bracket, Heatsink	6506135010	1
43	Heatsink, Power	7502008510	1
44	Heatsink, Regulator TR.	7505206220	1
45	Heatsink, Regulator TR.	7505206120	2
46	Bracket, PCB	6505134910	1
47	Terminal, Speaker, 8P	4408105810	1
48	Terminal, Speaker, 2P	4408108710	1
49	Frame, Left	6121608930	1
50	Chassis, Front, SECC	6122214510	1
51	Cover, Top	046122022421	1
52	Stopper, Cord	6518002310	1
53	⚠ Cord, AC, Power	4308000430	1
54	Sistem Ground	4408103720	1
55	Jack, RCA, 4P	4438103410	1
56	Heatsink, Regulator TR.	7505202410	4
57	Jack, RCA, 4P	4438103110	1
58	Jack, RCA, 4P, with Ground	4438108010	1
59	Holder, LED	6045010810	1
60	Holder, FL	6043010210	1
61	Button, 4key	048543069511	1
62	RCA, 2P	4438111310	1
<b>HARDWARE KIT</b>			
S1	Screw, #B BTT 3x8B	8179130083	50
S2	Screw, #1PTC 3x10B	8119130103	10
S3	Screw, #2BTC 3x8Y	8109230081	7
S4	Screw, #B WPTT 3x6Y	8179230061	22
S5	Screw, #HEX MSPW 3x12	8099130121	12
S6	Screw, WSAM 4x8B	8159440083	10
S7	Screw, Ground	8155000710	7
<b>MISCELLANEOUS</b>			
Trans	Power Transformer, 230 V, 50 Hz	2828100257	1
	Card Cable, 25P, 210mm	4118625210	1
	Ass'y Posistor, 180mm	052438000183	2

## PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the part list are of special significance to safety. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

**NOTE**

GENERAL UNIT

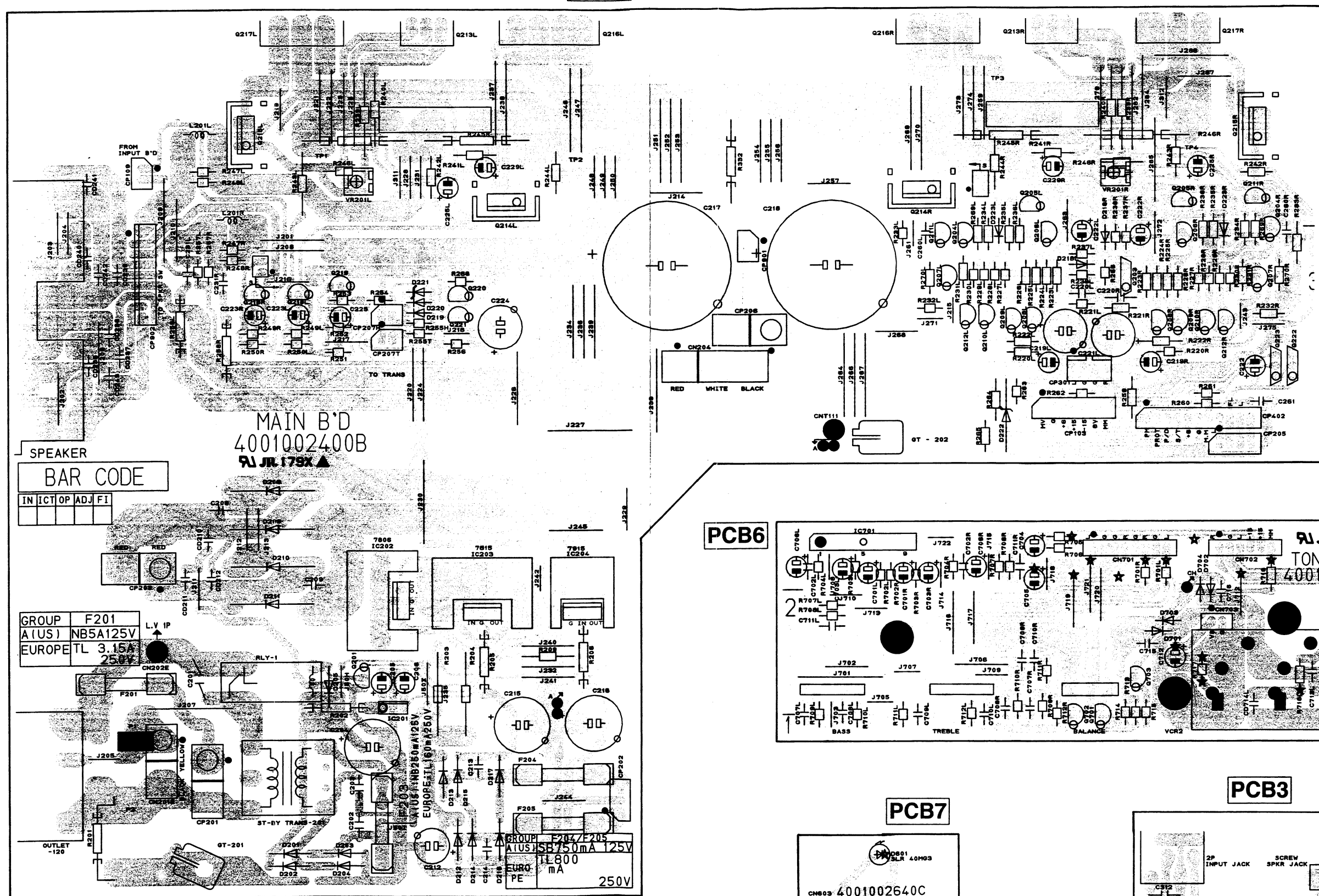


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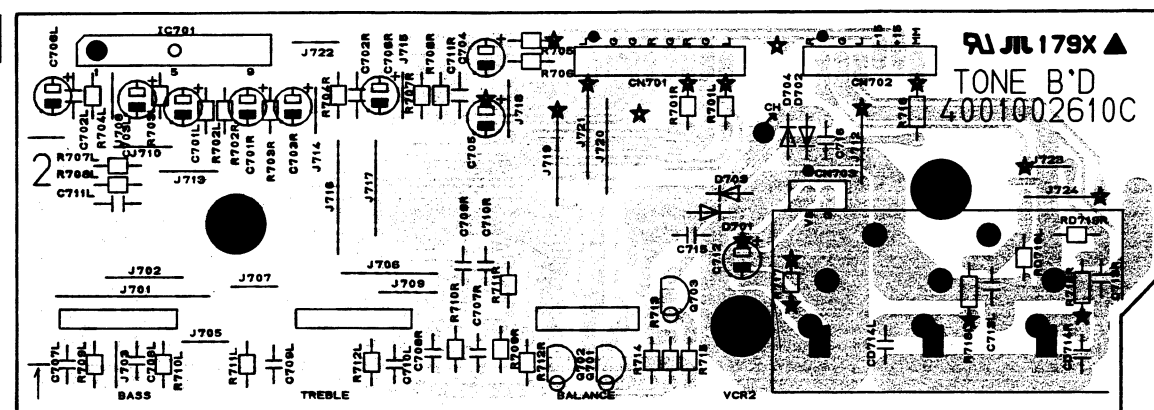
## PRINTED CIRCUIT BOARDS

PCB1

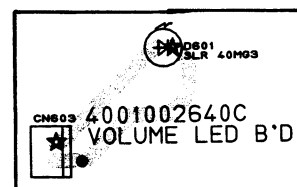


PCB1

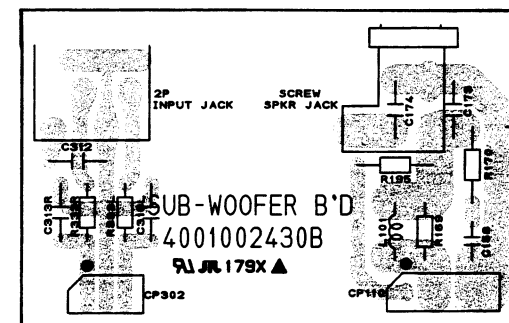
PCB6



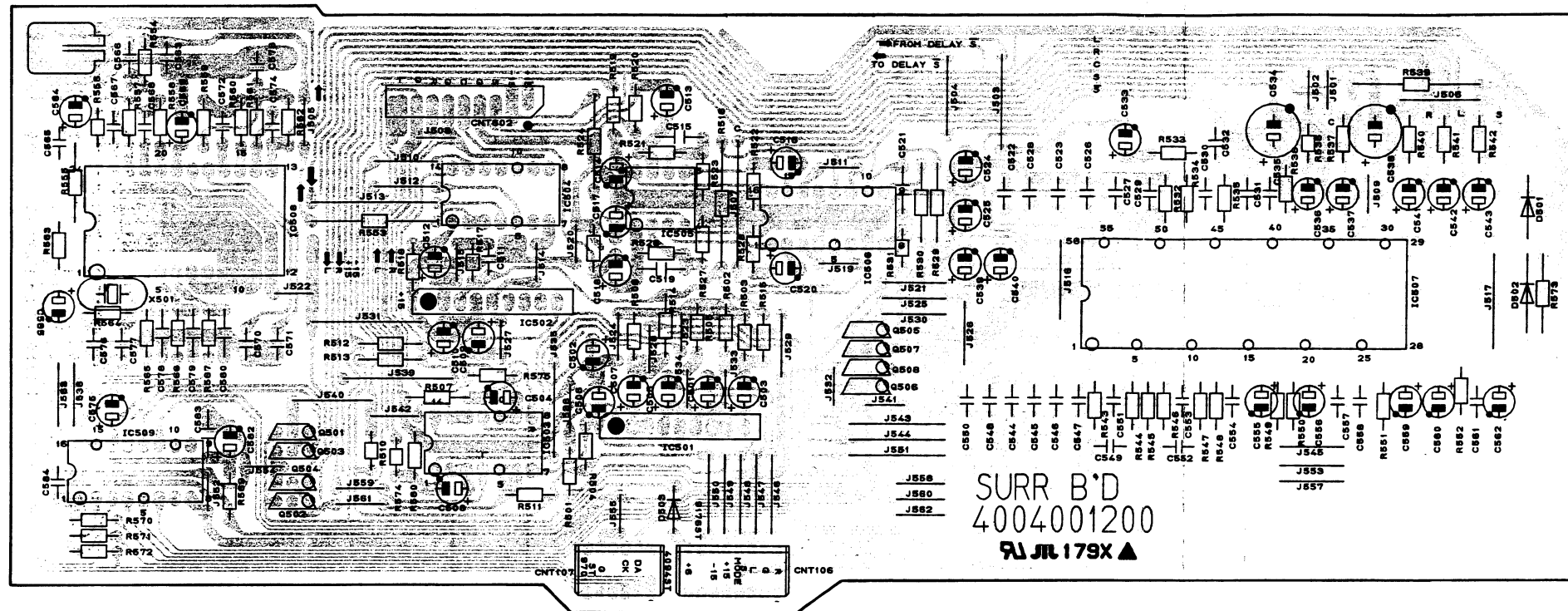
PCB7



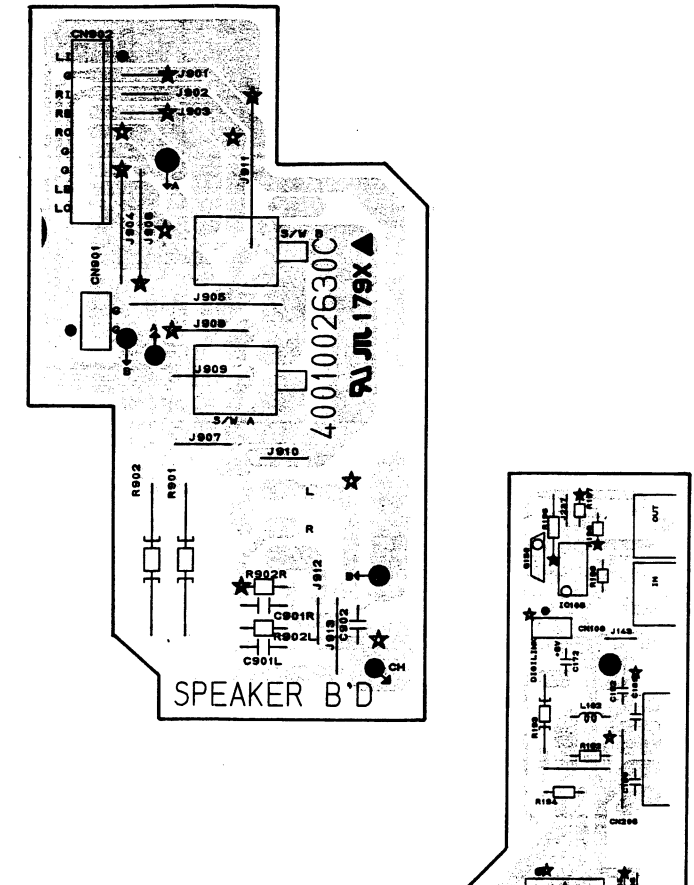
PCB3



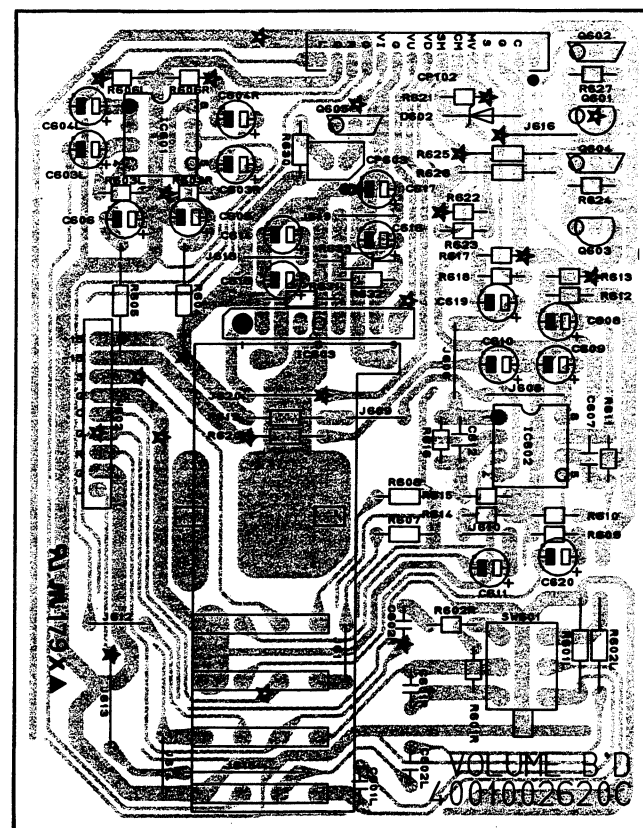
PCB11



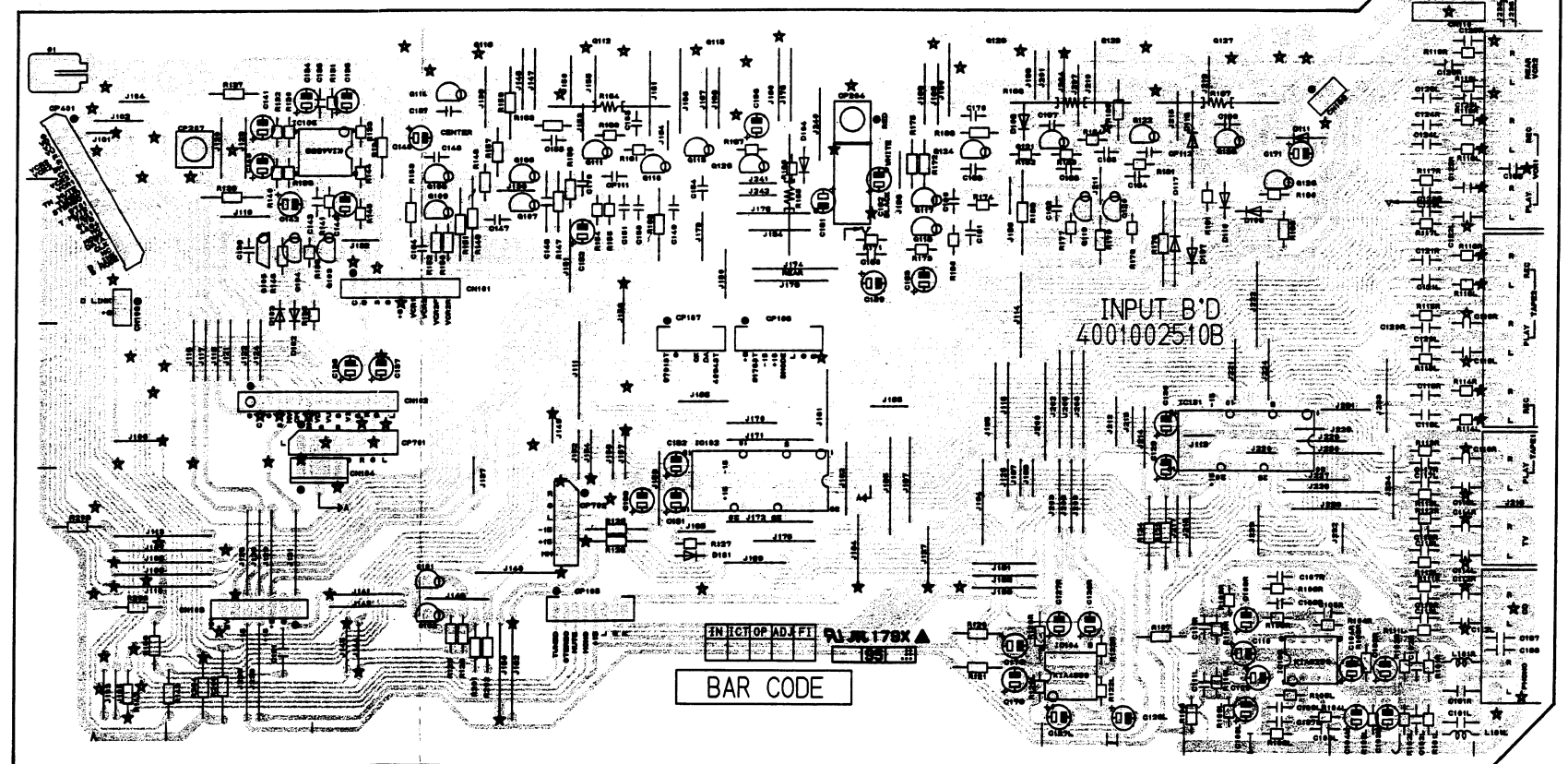
PCB8



PCB5

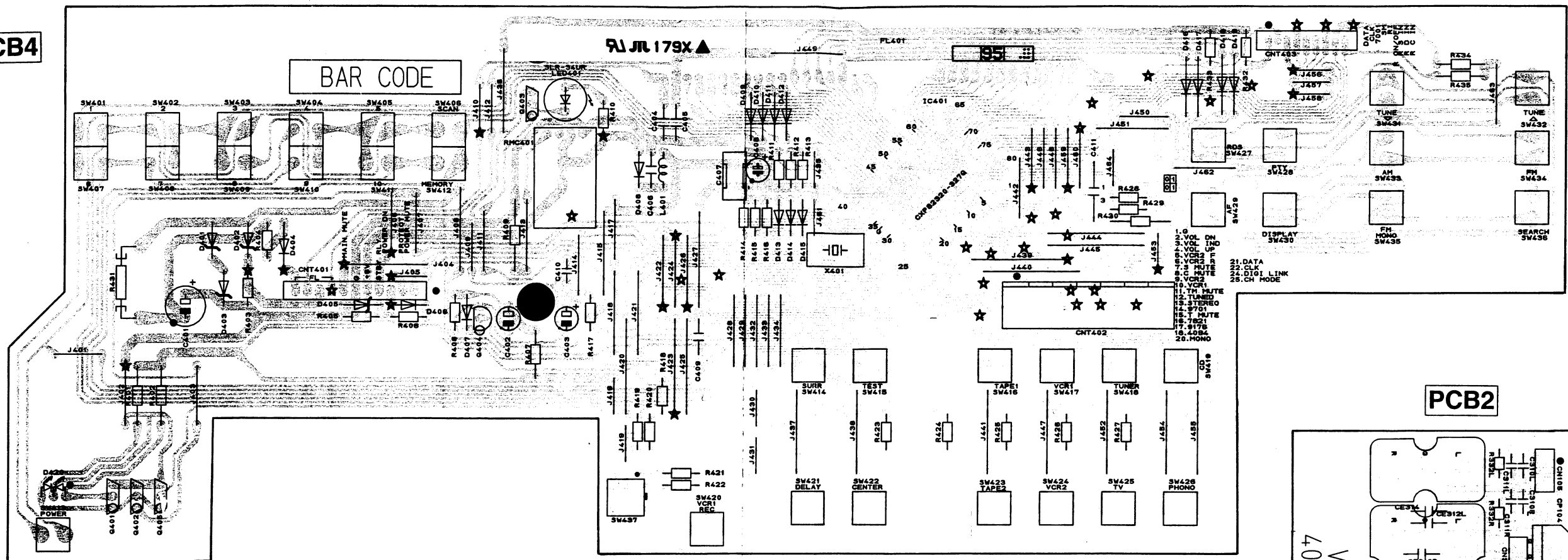


PCB10

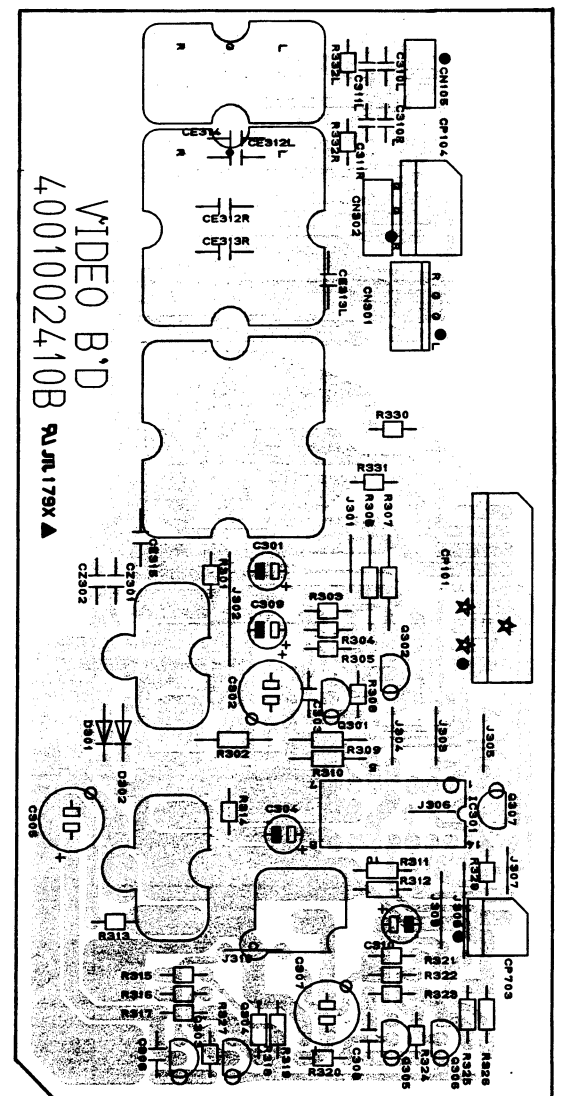




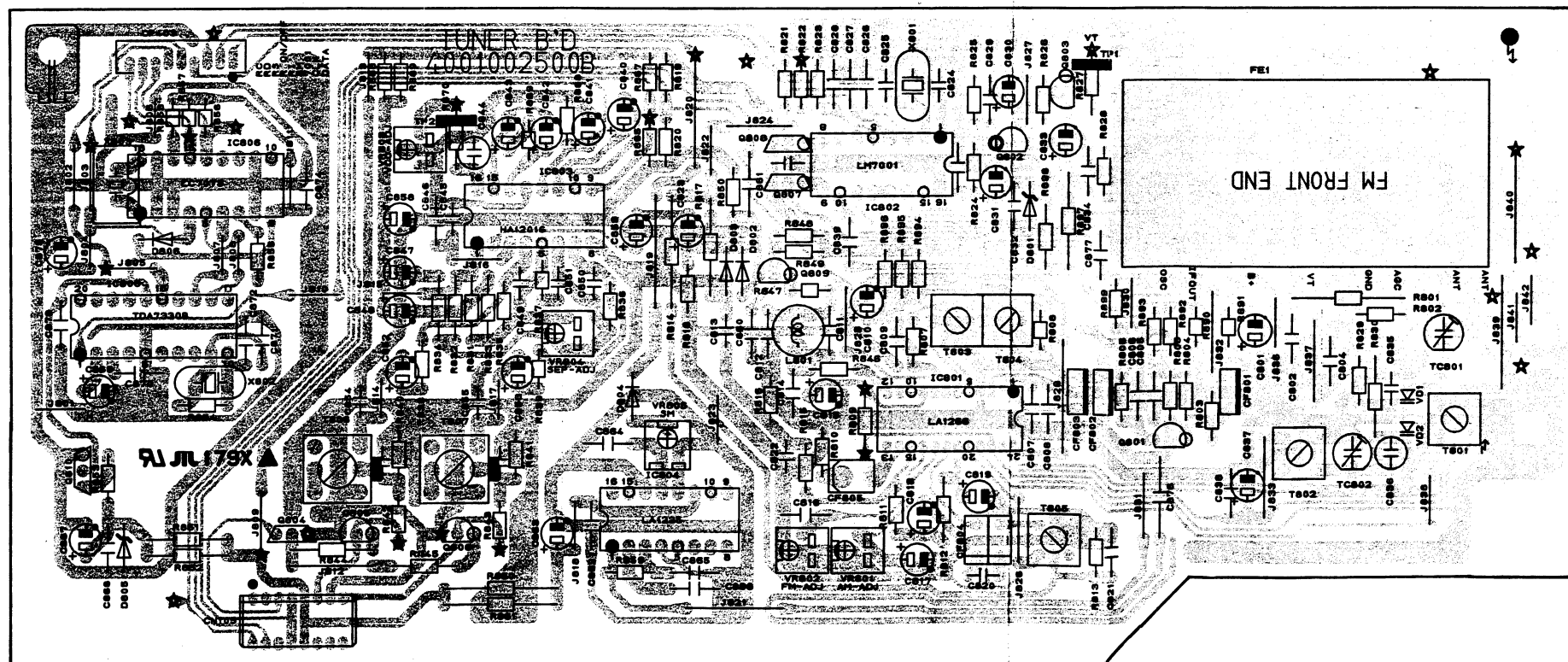
**PCB4**



**PCB2**



**PCB9**





# ELECTRICAL PARTS LIST

**PRODUCT SAFETY NOTICE :** Products marked with  $\Delta$  have special characteristics important to safety.

If you replace any of these components, read carefully the product safety notice in this manual.

Don't degrade the safety of the product through improper servicing.

Resistor/Capacitor tolerance – D : ( $\pm 0.5\%$ ), J : ( $\pm 5\%$ ), K : ( $\pm 10\%$ ), M : ( $\pm 20\%$ ), Z : +80, – 20%

Ref. No.	Description	Mfr. Part No.	Q'ty	Ref. No.	Description	Mfr. Part No.	Q'ty
<b>PCB1</b>	<b>ASSEMBLY P.C. BOARD MAIN</b>			Q219	KTA1015Y/BKTA1266Y, PNP	2208206105	1
	<b>CAPACITORS</b>			Q220/221	KTC1815Y/BKTC3198Y,NPN	2208060104	2
C201	Ceramic Disc	0.0047 uF	400 V J	3548472340	1	2208622106	1
C202/203	Ceramic Tubular	0.047 uF	50 V Z	3519473935	2	2238006103	1
C204	Electrolytic SG	470 uF	25 V M	3409347149	1		
C205	Not Used !						
C206	Electrolytic SG	22 uF	50 V M	3479322071	1		
C208/209	Mylar	0.1 uF	250 V J	3679104257	2		
C212	Electric SG	100 uF	35 V M	3479310161	1		
C213/214	Mylar	0.047 uF	100 V J	3679473120	2		
$\Delta$ C215/216	Electrolytic SG	1000 uF	35 V M	3409310269	2		
$\Delta$ C217/218	Electrolytic HM	8200 uF	63 V M	3419582235	2		
C219/L/R	Electrolytic SG	47 uF	25 V M	3479347041	2		
C220/L/R	Electrolytic SG	100 uF	50 V M	3479310171	2		
C221/L/R	Electrolytic SG	470 uF	10 V M	3479347121	2		
C222	Electrolytic SG	10 uF	50 V M	3479310071	1		
C222/L/R	Electrolytic SG	1 uF	50 V M	3479310971	2		
C223/L/R	Electrolytic SG	10 uF	50 V M	3479310071	2		
C224	Electrolytic SG	470 uF	10 V M	3479347121	1		
C225	Electrolytic SG	1 uF	50 V M	3479310971	1		
C225/L/R	Electrolytic SG	10 uF	50 V M	3479310071	2		
C229/L/R	Electrolytic SG	4.7 uF	50 V M	3479347971	2		
C231/L/R	Mylar	0.047 uF	100 V J	3679473120	2		
C260/L/R	Ceramic Disc	5 pF	50 V D	3579509030	2		
C261	Not Used !						
$\Delta$ CD210-CD212	Mylar	0.1 uF	250 V J	3679104257	3		
CD237-CD239	Ceramic Disc	0.0022 uF	50 V Z	3579222530	3		
CD242	Ceramic Disc	0.0022 uF	50 V Z	3579222530	1		
	<b>COILS</b>						
L201/L/R	Inductor, 0.5 uH			2648001010	2		
	<b>CONNECTORS</b>						
CN204	Lead Ass'y 3P 530mm			4358800353	1		
CP103	Wafer 7P			4428505410	1		
CP109	Wafer 2P			4428508210	1		
CP201	Wafer 2P, AC			4428525780	1		
CP202	Wafer 3P			4428505710	1		
CP203	Wafer 2P, AC			4428525780	1		
CP205	Wafer 4P			4428505610	1		
CP206	Wafer 2P, AC			4428525780	1		
CP207H	Wafer 2P			4428508210	1		
CP207T	Wafer 2P			4428508210	1		
CP301	Wafer 4P			4428517710	1		
CP402	Wafer 11P			4428510710	1		
CP901	Wafer 2P			4428508210	1		
CP902	Wafer 9P			4428518210	1		
CNT111	Lead Ass'y, 1P 420mm			4359824042	1		
	<b>DIODES</b>						
$\Delta$ D201-205	1N4002, Rectifier			2258100135	5		
$\Delta$ D208-211	PX6A03, Rectifier			2058100138	4		
$\Delta$ D212-217	1N4002, Rectifier			2258100135	6		
D218/L/R	1N4148M, Switching			2058322101	2		
D219/220	1N4148M, Switching			2058322101	2		
D221	Zener, UZ 9.1 BSC			2258599107	1		
D222	Zener, UZ 4.3 BSB			2258599102	1		
D223/L/R	1N4148M, Switching			2058322101	2		
	<b>INTEGRATED CIRCUITS</b>						
$\Delta$ IC201/202	GL7806, Regulator			2168601110	2		
$\Delta$ IC203	GL7815, Regulator			2168602109	1		
$\Delta$ IC204	GL7915, Regulator			2168602114	1		
	<b>TRANSISTORS</b>						
Q201	KTC1815Y/BKTC3198Y,NPN			2208060104	1		
Q203	DTC114YS, NPN			2208622106	1		
Q204/L/R	KTA970/KTA1268, PNP			2208206104	2		
Q205/L/R	KTA1015Y/BKTA1266Y, PNP			2208206105	2		
Q206/L/R	KTA970/KTA1268, PNP			2208206104	2		
Q207/L/R	KTC2240/BKTC3200, NPN			2208606108	2		
Q208/L/R	KTA970/KTA1268, PNP			2208206104	2		
Q209/L/R	KTA970/KTA1268, PNP			2208206104	2		
Q210/L/R	KTC2240/BKTC3200, NPN			2208606108	2		
Q211/L/R	BKTA949/KTA1024, PNP			2208206102	2		
Q212/L/R	KTC2229/KTC3206, NPN			2208606107	2		
Q213/L/R	2SC4137, Bias NPN			2008622110	2		
Q214/L/R	2SC4883A, NPN			2028316100	2		
Q215/L/R	2SA1859A, PNP			2028016100	2		
$\Delta$ Q216/L/R	2SC3182N-O			2028307101	2		
$\Delta$ Q217/L/R	2SA1265N-O			2028007101	2		
Q218/L/R	KTC1815Y/BKTC3198Y,NPN			2208060104	2		
	<b>RESISTORS</b>						
$\Delta$ R202	Metal Film	4.7 ohm	1 W J	3029479472	1		
$\Delta$ R203/204	Metal Film	22 ohm	2 W J	3029220572	2		
$\Delta$ R205	Metal Film	10 ohm	1 W J	3029100472	1		
$\Delta$ R206	Metal Film	4.7 ohm	1 W J	3029479472	1		
R209	Carbon Film	3.3 kohm	1/5 W J	3069332970	1		
R220/L/R	Carbon Film	330 ohm	1/5 W J	3069331970	2		
R221/L/R	Carbon Film	33 kohm	1/5 W J	3069333970	2		
R222/L/R	Carbon Film	1 kohm	1/5 W J	3069102970	2		
R223/L/R	Carbon Film	1.5 kohm	1/5 W J	3069152970	2		
R224/L/R	Carbon Film	390 ohm	1/5 W J	3069391970	2		
R225/L/R	Carbon Film	1.5 kohm	1/5 W J	3069152970	2		
R226/L/R	Carbon Film	390 ohm	1/5 W J	3069391970	2		
R227/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	2		
R228/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	2		
R229/L/R	Carbon Film	82 ohm	1/5 W J	3069820970	2		
R230/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	2		
R231/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	2		
R232/L/R	Carbon Film	22 kohm	1/5 W J	3069223970	2		
R233/L/R	Carbon Film	22 kohm	1/5 W J	3069223970	2		
R234/L/R	Carbon Film	82 ohm	1/5 W J	3069820970	2		
R235/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	2		
R236/L/R	Carbon Film	270 ohm	1/5 W J	3069271970	2		
R237/L/R	Carbon Film	10 kohm	1/5 W J	3069103970	2		
R238/L/R	Carbon Film	33 kohm	1/5 W J	3069333970	2		
R239/L/R	Metal Film	442 ohm	1/4 W J	3027442025	2		
R240/L/R	Metal Film	1.21 kohm	1/4 W J	3027121125	2		
R241/L/R	Carbon Film	82 ohm	1/5 W J	3069820970	2		
R242/L/R	Carbon Film	33 kohm	1/5 W J	3069333970	2		
R243/L/R	Carbon Film	2 kohm	1/5 W J	3069202970	2		
R244/L/R	Carbon Film	1.8 kohm	1/5 W J	3069182970	2		
$\Delta$ R245/L/R	Cement	0.27 ohm	5 W K	3059278782	2		
$\Delta$ R246/L/R	Cement	0.27 ohm	5 W K	3059278782	2		
R247/L/R	Carbon Film	22 ohm	1/5 W J	3069220970	2		
R248/L/R	Carbon Film	22 ohm	1/5 W J	3069220970	2		
R249/L/R	Carbon Film	910 ohm	1/5 W J	3069911970	2		
R250/L/R	Carbon Film	6.8 kohm	1/5 W J	3069682970	2		
R251/L/R	Carbon Film	68 kohm	1/5 W J	3069683970	2		
R252/L/R	Carbon Film	100 kohm	1/5 W J	3069104970	2		
R253/L/R	Carbon Film	3.3 kohm	1/5 W J	3069332970	2		
R254/L/R	Carbon Film	1 kohm	1/5 W J	3069102970	2		
R255T	Carbon Film	4.7 kohm	1/5 W J	3069472970	1		
R255H	Carbon Film	6.8 kohm	1/5 W J	3069682970	1		
R256	Carbon Film	10 kohm	1/5 W J	3069103970	1		
R257/L/R	Carbon Film	24 kohm	1/5 W J	3069243970	2		
R258/L/R	Metal Film	10 ohm	1 W J	3029100472	2		
R259	Carbon Film	10 kohm	1/5 W J	3069103970	1		
R260	Carbon Film	10 kohm	1/5 W J	3069103970	1		
R261	Carbon Film	10 kohm	1/5 W J	3069103970	1		
R262	Carbon Film	1 kohm	1/5 W J	3069102970	1		
R263	Carbon Film	2.4 kohm	1/5 W J	3069242970	1		
R264	Carbon Film	22 kohm	1/5 W J	3069223970	1		
R265	Carbon Film	15 kohm	1/5 W J	3069153970	1		
R266	Carbon Film	150 kohm	1/5 W J	3069154970	1		
R269/L/R	Carbon Film	560 ohm	1/5 W J	3069561970	1		
R270/L/R	Carbon Film	2.4 kohm	1/5 W J	3069242970	1		
	<b>FUSES</b>						
$\Delta$ F201	5T 3.15 A, 250 V			5508302735	1		
$\Delta$ F203	TL 160 mA, 250 V			5508301034	1		
$\Delta$ F204/205	TL800 mA, 250 V			5508301934	2		
	<b>MISCELLANEOUS</b>						
44	Heatsink, Regulator TR.			7505206220	1		
45	Heatsink, Regulator TR.			7505206120	2		
47	Terminal, Speaker, 8P			4408105810	1		
56	Heatsink, Regulator TR.			7505202410	4		
RLY-1	OEG SDT-SS-112DM, Relay			5528043000	1		
$\Delta$ TRANS201	Transformer, Standby			2828090901	1		
GT202	Ground Plate			4235007310	2		
	Pin Solder			4228001410	2		
	Clip Fuse			4255001010	8		

Ref. No.	Description	Mfr. Part No.	Q'ty	Ref. No.	Description	Mfr. Part No.	Q'ty
<b>PCB2 ASSEMBLY P.C. BOARD VIDEO</b>				<b>MISCELLANEOUS</b>			
<b>CAPACITORS</b>				48	Terminal, Speaker, 2P	4408108710	1
C301	Electrolytic SG	33 uF	25 V M	3479333041	1	4438111310	1
C302	Electric SG	470 uF	10 V M	3479347121	1		
C303	Ceramic Tubular	1 pF	50 V D	3519010935	1		
C304	Electrolytic SG	33 uF	25 V M	3479333041	1		
C305	Electric SG	470 uF	10 V M	3479347121	1		
C306	Ceramic Tubular	1 pF	50 V D	3519010935	1		
C307	Electric SG	470 uF	10 V M	3479347121	1		
C308	Ceramic Tubular	1 pF	50 V D	3519010935	1		
C309	Electric SG	100 uF	10 V M	3479310121	1		
C310	Not Used I						
CZ301/302	Ceramic Tubular	0.1 uF	50 V Z	3519104935	2		
<b>CONNECTORS</b>				<b>PCB4 ASSEMBLY P.C. BOARD FRONT</b>			
CN301	Lead Ass'y 4P, Shield, 600 mm	436204608331	1	<b>CAPACITORS</b>			
CN302	Lead Ass'y, 3P, 300mm	436103303331	1	C401	Electrolytic SG	100 uF	50 V M
CP101	Wafer 9P, Angle	4428513490	1	C402	Electrolytic SG	10 uF	50 V M
CP104	Wafer 4P, Angle	4428513440	1	C403	Electrolytic SG	1 uF	50 V M
CP703	Wafer 2P, Angle	4428513420	1	C404/C405	Ceramic Tubular	0.047 uF	50 V Z
<b>DIODES</b>				C406	Ceramic Tubular	0.1 uF	50 V Z
D301/302	1N4148M, Switching	2058322101	2	C407	Electrolytic, Back-up	0.047 uF	5.5 V K
<b>INTEGRATED CIRCUIT</b>				C408	Electrolytic SSE	47 uF	10 V M
IC301	GD4066, Switching	2138001101	1	C409	Ceramic Tubular	820 pF	50 V J
<b>TRANSISTORS</b>				C410	Ceramic Disc	0.1 uF	50 V Z
Q301	KTA1015Y/BKTA1266Y, PNP	2208206105	1	C411	Ceramic Tubular	0.1 uF	50 V Z
Q302	KTC1815Y/BKTC3198Y,NPN	2208606104	1	<b>CONNECTORS</b>			
Q303	KTA1015Y/BKTA1266Y, PNP	2208206105	1	CNT401	Lead Ass'y, 11P, 220 mm	436111203331	1
Q304	KTC1815Y/BKTC3198Y,NPN	2208606104	1	CNT402	Wafer, 25P, 52575-2530	4428525826	1
Q305	KTA1015Y/BKTA1266Y, PNP	2208206105	1	CNT403	Lead Ass'y, 9P, 300 mm	436209303332	1
Q306	KTC1815Y/BKTC3198Y,NPN	2208606104	1	<b>DIODES</b>			
Q307	FET, 2SK117Y	2218207106	1	D401	Zener, UZ 16.0 BSD	2258599117	1
<b>RESISTORS</b>				D402	Zener, UZ 9.1 BSC	2258599107	1
R301/302	Carbon Film	75 ohm	1/5 W J	D403	Zener, UZ 16.0 BSD	2258599117	1
R303	Carbon Film	12 kohm	1/5 W J	D404	1N4002, Rectifier	2258100135	1
R304	Carbon Film	1.2 kohm	1/5 W J	D405	Zener, UZ 4.3 BSB	2258599102	1
R305	Carbon Film	180 ohm	1/5 W J	D406-D419	1N4148M, Switching	2058322101	14
R306	Carbon Film	150 ohm	1/5 W J	D420	LED, SPR54MDW, Amber/Green	2308222205	1
R307	Carbon Film	8.2 kohm	1/5 W J	<b>INTEGRATED CIRCUIT</b>			
R308	Carbon Film	1.2 kohm	1/5 W J	IC401	CPU, CXP82320-310Q	2138322195	1
R309-312	Carbon Film	100 kohm	1/5 W J	<b>TRANSISTORS</b>			
R313/314	Carbon Film	75 ohm	1/5 W J	Q401-Q403	DTC114YS, NPN	2208622106	3
R315	Carbon Film	12 kohm	1/5 W J	Q404	KTC1815Y/BKTC3198Y,NPN	2208606104	1
R316	Carbon Film	1.2 kohm	1/5 W J	Q405	DTC114YS, NPN	2208622106	1
R317	Carbon Film	180 ohm	1/5 W J	<b>RESISTORS</b>			
R318	Carbon Film	150 ohm	1/5 W J	R401	Metal Film	220 ohm	1/5 W J
R319	Carbon Film	8.2 kohm	1/5 W J	R402	Metal Film	270 ohm	1/5 W J
R320	Carbon Film	75 ohm	1/5 W J	R403	Carbon Film	15 kohm	1/5 W J
R321	Carbon Film	12 kohm	1/5 W J	R404	Metal Film	100 ohm	1/5 W J
R322	Carbon Film	1.2 kohm	1/5 W J	R405/R406	Metal Film	4.7 kohm	1/5 W J
R323	Carbon Film	180 ohm	1/5 W J	R407	Metal Film	330 ohm	1/5 W J
R324	Carbon Film	1.2 kohm	1/5 W J	R408	Carbon Film	10 kohm	1/5 W J
R325	Carbon Film	150 ohm	1/5 W J	R409	Carbon Film	47 kohm	1/5 W J
R326	Carbon Film	8.2 kohm	1/5 W J	R410	Metal Film	470 ohm	1/5 W J
R327	Carbon Film	1.2 kohm	1/5 W J	R414-R416	Carbon Film	47 kohm	1/5 W J
R329	Carbon Film	1 Mohm	1/5 W J	R417	Carbon Film	100 kohm	1/5 W J
R330/331	Carbon Film	470 ohm	1/5 W J	R418	Metal Film	3.3 kohm	1/5 W J
<b>MISCELLANEOUS</b>				R419/R420	Carbon Film	10 kohm	1/5 W J
40	Jack, RCA, 2P with Ground	4438109310	1	R421	Carbon Film	22 kohm	1/5 W J
41	Jack, RCA, 1P, Yellow	4438113810	1	R422	Carbon Film	10 kohm	1/5 W J
55	Jack, RCA, 4P	4438103410	1	R423-R427	Carbon Film	47 kohm	1/5 W J
<b>PCB3 ASSEMBLY P.C. BOARD SUB-WOOFER</b>				R428/R429	Carbon Film	10 kohm	1/5 W J
<b>CAPACITORS</b>				R430	Metal Film	330 ohm	1/5 W J
C158	Mylar	0.047 uF	100 V J	R431	Metal Film	390 ohm	1 W J
C173	Ceramic Tubular	0.0022 uF	16 V K	<b>COIL</b>			
C174	Ceramic Tubular	0.1 uF	50 V Z	L401	Inductor 100 uH	264810182	1
C312	Ceramic Tubular	0.1 uF	50 V Z	<b>MISCELLANEOUS</b>			
<b>COIL</b>				9	Switch, Tact	4658003710	31
L101	Inductor, 0.5 uH	2648001010	1	16	Switch, Push, 1key, ABS, Black	4628054410	1
<b>CONNECTORS</b>				FL401	CM1361C, FL Display	232802306	1
CP110	Wafer, 5P	4428506910	1	LED401	SLR-34URC25, Red	2371124701	1
CP302	Wafer, 3P	4428505710	1	RMC401	TFMT5380, 38 kHz, Remocon sensor	2408050001	1
<b>RESISTORS</b>				X401	Resonator, 10 MHz	3938124010	1
R169	Carbon Film	10 ohm	1/5 W J	<b>PCB5 ASSEMBLY P.C. BOARD VOLUME</b>			
R170	Carbon Film	10 ohm	1/4 W J	<b>CAPACITORS</b>			
R195	Carbon Film	24 kohm	1/5 W J	C601/LR	Mylar	0.1 uF	63 V J
R333/LR	Carbon Film	1 ohm	1/5 W J	C602/LR	Ceramic Tubular	680 pF	50 V J
				C603/LR	Electrolytic SG	4.7 uF	50 V M
				C604/LR	Electrolytic SG	4.7 uF	50 V M
				C605/606	Electrolytic SG	47 uF	25 V M
				C607	Ceramic Tubular	1000 pF	50 V J
				C608	Electrolytic SG	1 uF	50 V M
				C609/610	Electrolytic SG	47 uF	25 V M
				C611	Electrolytic SG	1 uF	50 V M
				C612	Ceramic Tubular	1000 pF	50 V J
				C614	Electrolytic SG	10 uF	50 V M
				C615/616	Electrolytic SG	100 uF	10 V M
				C617	Electrolytic SG	100 uF	16 V M
				C619	Electrolytic SG	1 uF	50 V M
				C620	Electrolytic SG	1 uF	50 V M

Ref. No.	Description	Mfr. Part No.	Q'ty	Ref. No.	Description	Mfr. Part No.	Q'ty
<b>CONNECTORS</b>				<b>CONNECTORS</b>			
CP102	Wafer 15P	4428517410	1	R709/LR	Carbon Film	18 kohm 1/5 W J	3069183970 2
CN602	Lead Ass'y 180mm 9P	436109183331	1	R710/LR	Carbon Film	3.9 kohm 1/5 W J	3069392970 2
CP603	Wafer 2P	4428508210	1	R711/LR	Carbon Film	2.7 kohm 1/5 W J	3069272970 2
<b>DIODE</b>				R712/LR	Carbon Film	750 ohm 1/5 W J	3069751970 2
D602	Zener, UZ 4.3 BSB	2258599102	1	R713/714	Carbon Film	1 kohm 1/5 W J	3069102970 2
<b>INTEGRATED CIRCUITS</b>				R715	Carbon Film	10 kohm 1/5 W J	3069103970 1
IC601/602	KIA7559P/KIA4559P	2168206104	2	R716	Carbon Film	470 ohm 1/5 W J	3069471970 1
IC603	TA7291S	2168007204	1	R717	Carbon Film	75 ohm 1/5 W J	3069750970 1
<b>TRANSISTORS</b>				R718/LR	Carbon Film	1 kohm 1/5 W J	3069102970 2
Q601	KTD1302, NPN	2208606112	1	<b>MISCELLANEOUS</b>			
Q602	DTA114Y/KRA107M, PNP	2238006103	1	17	Volume, Bass/Treble	3208049510	2
Q603	KTD1302, NPN	2208606112	1	18	Volume, Balance	3208052010	1
Q604	DTA114Y/KRA107M, PNP	2238006103	1	20	Jack, RCA, 3P, VCR	4438109710	1
Q605	DTC114TS, NPN	2208622108	1	<b>PCB7 ASSEMBLY P.C. BOARD VOLUME LED</b>			
<b>RESISTORS</b>				CN603	Lead Ass'y 180mm 2P	435102183181	1
R601/LR	Carbon Film	5.1 kohm 1/5 W J	3069512970 2	D601	LED, SLR40MG3	2308220324	1
R602/LR	Carbon Film	18 kohm 1/5 W J	3069183970 2	<b>PCB8 ASSEMBLY P.C. BOARD SPEAKER</b>			
R603/LR	Carbon Film	100 kohm 1/5 W J	3069104970 2	C902	Ceramic Disc	0.1 uF 50 V Z	3579104530 1
R604/605	Carbon Film	100 ohm 1/5 W J	3069101970 2	CN901	Lead Ass'y, 2P, 280mm	436102283321	1
R606/LR	Carbon Film	100 kohm 1/5 W J	3069104970 2	CN902	Lead Ass'y, 9P, 400mm	435209403401	1
R607/608	Carbon Film	5.1 kohm 1/5 W J	3069512970 2	R901/R902	Metal Film	270 ohm 2 W J	3029271572 2
R609	Carbon Film	47 kohm 1/5 W J	3069473970 1	11	jack, Phone	4438005020	1
R610	Carbon Film	1 kohm 1/5 W J	3069102970 1	12	Switch, Push, ABS, Black	4628043810	2
R611	Carbon Film	6.2 kohm 1/5 W J	3069622970 1	<b>PCB9 ASSEMBLY P.C. BOARD TUNER</b>			
R612	Carbon Film	47 kohm 1/5 W J	3069473970 1	<b>CAPACITORS</b>			
R613	Carbon Film	470 ohm 1/5 W J	3069471970 1	C801	Electrolytic SG	100 uF 25 V M	3479310141 1
R614	Carbon Film	47 kohm 1/5 W J	3069473970 1	C802	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
R615	Carbon Film	1 kohm 1/5 W J	3069102970 1	C804-809	Ceramic Tubular	0.022 uF 25 V K	3519223520 6
R616	Carbon Film	6.2 kohm 1/5 W J	3069622970 1	C810	Electrolytic SG	47 uF 16 V M	3479347031 1
R617	Carbon Film	47 kohm 1/5 W J	3069473970 1	C811	Ceramic Tubular	82 pF 50 V J	3519820935 1
R618	Carbon Film	470 ohm 1/5 W J	3069471970 1	C812	Ceramic Tubular	100 pF 50 V J	3519101935 1
R619/620	Carbon Film	100 ohm 1/5 W J	3069101970 2	C813	Mylar	0.033 uF 100 V J	3679333120 1
R621	Carbon Film	2.4 kohm 1/5 W J	3069242970 1	C814	Ceramic Tubular	100 pF 50 V J	3519101935 1
R622-624	Carbon Film	1 kohm 1/5 W J	3069102970 3	C815	Electrolytic SG	0.47 uF 50 V M	3479347871 1
R625	Carbon Film	470 ohm 1/5 W J	3069471970 1	C816	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
R628	Carbon Film	470 ohm 1/5 W J	3069471970 1	C817	Electrolytic SG	4.7 uF 50 V M	3479347971 1
R630	Carbon Film	560 ohm 1/5 W J	3069561970 1	C818	Electrolytic SG	3.3 uF 50 V M	3479333971 1
R631	Carbon Film	4.7 ohm 1/5 W J	3069479970 1	C819	Electrolytic SG	4.7 uF 50 V M	3479347971 1
R632	Carbon Film	10 kohm 1/5 W J	3069103970 1	C820	Ceramic Disc	47 pF 50 V J	3579470130 1
R633	Carbon Film	3 kohm 1/5 W J	3069302970 1	C821	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
<b>MISCELLANEOUS</b>				C822	Mylar	0.0033 uF 100 V J	3679332120 1
22	Switch, Push, Loud	4628059610	1	C823	Electrolytic SG	4.7 uF 50 V M	3479347971 1
23	Volume, Motor	3228019410	1	C824/825	Ceramic Disc CH	33 pF 50 V J	3528330210 2
<b>PCB6 ASSEMBLY P.C. BOARD TONE</b>				C826	Ceramic Tubular	100 pF 50 V J	3519101935 1
<b>CAPACITORS</b>				C829	Ceramic Tubular	0.01 uF 16 V Z	3519103915 1
C701/LR	Electrolytic SG	10 uF 50 V M	3479310071 2	C830	Electrolytic SG	1 uF 50 V M	3479310971 1
C702/LR	Ceramic Tubular	47 pF 50 V J	3519470935 2	C831	Electrolytic SG	47 uF 16 V M	3479347031 1
C703/LR	Electrolytic SG	4.7 uF 50 V M	3479347971 2	C832	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
C704/705	Electrolytic SG	47 uF 25 V M	3479347041 2	C833	Electrolytic SG	47 uF 16 V M	3479347031 1
C706/LR	Electrolytic SG	10 uF 50 V M	3479310071 2	C834	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
C707/LR	Mylar	0.018 uF 100 V J	3679183120 2	C835	Mylar	0.047 uF 100 V J	3679473120 1
C708/LR	Mylar	0.082 uF 63 V J	3679823297 2	C836	Poly	470 pF 50 V J	3619471110 1
C709/LR	Mylar	0.0039 uF 100 V J	3679392120 2	C837	Electrolytic SG	10 uF 50 V M	3479310071 1
C710/LR	Mylar	0.018 uF 100 V J	3679183120 2	C838	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
C711/LR	Ceramic Tubular	560 pF 50 V J	3519561935 2	C839	Ceramic Tubular	0.01 uF 16 V Z	3519103915 1
C712	Electric SG	33 uF 25 V M	3479333041 1	C840	Electrolytic SG	3.3 uF 50 V M	3479333971 1
C713/LR	Ceramic Disc	100 pF 50 V J	3579101130 2	C841/842	Electrolytic SG	1 uF 50 V M	3479310971 2
C715/716	Ceramic Disc	0.1 uF 50 V Z	3579104530 2	C843	Electrolytic SG	3.3 uF 50 V M	3479333971 1
<b>CONNECTORS</b>				C844	Poly	0.001 uF 50 V J	3679102120 1
CN701	Lead Ass'y 200mm 8P	436108203331	1	C845	Mylar	0.047 uF 100 V J	3679473120 1
CN702	Lead Ass'y 220mm 6P	436106223331	1	C846	Ceramic Tubular	680 pF 50 V J	3519681935 1
CN703	Lead Ass'y 2P, 480 mm	436102483331	1	C847/848	Electrolytic SG	22 uF 35 V M	3479322061 2
<b>DIODES</b>				C849/850	Mylar	0.001 uF 100 V J	3679102120 2
D701-D704	1N4148M, Switching	2058322101	4	C851	Ceramic Disc	270 pF 50 V J	3579271130 1
<b>INTEGRATED CIRCUIT</b>				C852/853	Electrolytic SG	2.2 uF 50 V M	3479322971 2
IC701	KIA7559S/KIA4559S	2168206103	1	C854/855	Mylar	0.0022 uF 100 V J	3679222120 2
<b>TRANSISTOR</b>				C858	Electrolytic SG	100 uF 25 V M	3479310141 1
Q701/702	KTD1302, NPN	2208606112	2	C859	Electrolytic SG	4.7 uF 50 V M	3479347971 1
Q703	KTA1015Y/BKTA1266Y, PNP	2208206105	1	C860	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
<b>RESISTORS</b>				C861	Ceramic Tubular	270 pF 50 V J	3519271935 1
R701/LR	Carbon Film	1 kohm 1/5 W J	3069102970 2	C862	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
R702/LR	Carbon Film	100 kohm 1/5 W J	3069104970 2	C863	Electrolytic SG	47 uF 16 V M	3479347031 3
R703/LR	Carbon Film	100 kohm 1/5 W J	3069104970 2	C864-C866	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
R704/LR	Carbon Film	1 Mohm 1/5 W J	3069105970 2	C867	Electrolytic SG	47 uF 16 V M	3479347031 1
R705/706	Carbon Film	47 ohm 1/5 W J	3069470970 2	C868	Ceramic Tubular	0.022 uF 25 V K	3519223520 1
R707/LR	Carbon Film	1 kohm 1/5 W J	3069102970 2	C869	Electrolytic SG	10 uF 50 V M	3479310071 1
R708/LR	Carbon Film	100 kohm 1/5 W J	3069104970 2	C870	Ceramic Tubular	0.1 uF 50 V Z	3519104935 1
<b>PCB7 ASSEMBLY P.C. BOARD VOLUME LED</b>				C871/C872	Ceramic Tubular	27 pF 50 V J	3519270935 2
<b>PCB8 ASSEMBLY P.C. BOARD SPEAKER</b>				C873/C874	Ceramic Tubular	0.1 uF 50 V Z	3519104935 2
<b>PCB9 ASSEMBLY P.C. BOARD TUNER</b>				C875	Electrolytic SG	10 uF 50 V M	3479310071 1
<b>CAPACITORS</b>				C876	Ceramic Tubular	100 pF 50 V J	3519101935 1
<b>CAPACITORS</b>				TC801	Trimmer, 20 pF	3838001010	1
<b>CAPACITORS</b>				TC802	Trimmer, 10 pF	3838001000	1

Ref. No.	Description	Mfr. Part No.	Q'ty	Ref. No.	Description	Mfr. Part No.	Q'ty
<b>FILTERS</b>				<b>SEMI FIXED RESISTORS</b>			
CF801-803	SFE10.7MS3GH	3908011011	3	VR801	20 k(B)	3248020343	1
CF804	SFZ450F	3908001380	1	VR802	50 k(B)	3248050343	1
CF805	BFU450C	3908001020	1	VR803	5 k(B)	3248050243	1
<b>CONNECTORS</b>				VR804	500 k(B)	3248050443	1
CN105	Wafer, GB200-08S-LS	4428560080	1	VR805	50 k(B)	3248050342	1
CP403	Wafer, 9P	4428516810	1	<b>MISCELLANEOUS</b>			
<b>DIODES</b>				33	Terminal, Antenna	4408108210	1
D801	Zener, UZ 5.1 BSB	2258599103	1	FE1	FM Front End, FE407-G80	3928801890	1
D802-D804	1N4148M, Switching	2058322101	3	X801	Crystal, 7.2MHz	3978101031	1
D805	Zener, UZ 5.1BSB	2258599103	1	X802	Crystal, 4.332 MHz	3938201920	1
D806	1N4148M, Switching	2058322101	1	X803	Resonator, 4.00MGW	3938131570	1
VD1/VD2	KV1236Z, Diode, Varactor	2058819106	1	<b>PCB10 ASSEMBLY P.C. BOARD INPUT</b>			
<b>INTEGRATED CIRCUITS</b>				<b>CAPACITORS</b>			
IC801	LA1266	2168017128	1	C101/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
IC802	LM7001	2138017112	1	C102/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
IC803	HA12016	2168411105	1	C103/LR	Electrolytic SG 1 uF	50 V M	3479310971 2
IC804	LA1235	2168017146	1	C104/LR	Electric SG 33 uF	25 V M	3479332041 2
IC805	TDA7330B	2138025001	1	C105/LR	Ceramic Tubular 0.0022 uF	16 V K	3519222935 2
IC806	LC7073	2168017145	1	C106/LR	Mylar 0.0056 uF	100 V J	3679562120 2
<b>TRANSISTORS</b>				C107/LR	Mylar 0.0018 uF	100 V J	3679182120 2
Q801	KTC1923Y/KTC3194, NPN	2208406103	1	C108/LR	Electrolytic SG 1 uF	50 V M	3479310971 2
Q802	2SK168, FET	2018211100	1	C109/110	Electrolytic SG 47 uF	25 V M	3479347041 2
Q803	KTC2240/BKTC3200, NPN	2208606108	1	C111/LR	Mylar 0.0018 uF	100 V J	3679182120 2
Q804	DTA114Y/KRA107M, PNP	2238006103	1	C112/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
Q805/806	KTD1302, NPN	2208606112	2	C113/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
Q807/Q808	DTA114Y/KRA107M, PNP	2238006103	2	C114/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
Q809	KTC1815Y/BKTC3198Y, NPN	2208606104	1	C115/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
Q810	DTA114Y/KRA107M, PNP	2238006103	1	C116/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
<b>RESISTORS</b>				C117/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R801	Carbon Film 100 kohm 1/5 W J	3069104970	1	C118/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R802	Carbon Film 62 kohm 1/5 W J	3069623970	1	C119/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R803	Carbon Film 470 ohm 1/5 W J	3069471970	1	C120/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R804	Carbon Film 3.3 kohm 1/5 W J	3069332970	1	C121/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R805/806	Carbon Film 330 ohm 1/5 W J	3069331970	2	C122/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R807	Carbon Film 10 kohm 1/5 W J	3069103970	1	C123/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R808	Carbon Film 3.3 kohm 1/5 W J	3069332970	1	C124/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R809	Carbon Film 51 kohm 1/5 W J	3069513970	1	C125/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R810	Carbon Film 82 ohm 1/5 W J	3069820970	1	C126/LR	Ceramic Tubular 100 pF	50 V J	3519101935 2
R811	Carbon Film 22 kohm 1/5 W J	3069223970	1	C127/LR	Electrolytic SG 4.7 uF	50 V M	3479347971 2
R812	Carbon Film 10 kohm 1/5 W J	3069103970	1	C128/LR	Electrolytic SG 4.7 uF	50 V M	3479347971 2
R813	Carbon Film 68 kohm 1/5 W J	3069683970	1	C129-132	Electrolytic SG 47 uF	25 V M	3479347041 4
R814	Carbon Film 4.3 kohm 1/5 W J	3069432970	1	C133/134	Electrolytic SG 1 uF	50 V M	3479310971 2
R815	Carbon Film 4.7 kohm 1/5 W J	3069472970	1	C135	Ceramic Tubular 1000 pF	50 V J	3519102935 1
R816	Carbon Film 1.8 kohm 1/5 W J	3069182970	1	C136	Electrolytic SG 1 uF	50 V M	3479310971 1
R817/818	Carbon Film 100 kohm 1/5 W J	3069104970	2	C137	Electrolytic SG 47 uF	25 V M	3479347041 1
R819	Carbon Film 10 kohm 1/5 W J	3069103970	1	C138	Electrolytic SG 22 uF	25 V M	3479322041 1
R820	Carbon Film 4.7 kohm 1/5 W J	3069472970	1	C139	Mylar 0.022 uF	100 V J	3679223120 1
R821-823	Carbon Film 1 kohm 1/5 W J	3069102970	3	C140/141	Electrolytic SG 47 uF	25 V M	3479347041 2
R824	Carbon Film 820 ohm 1/5 W J	3069821970	1	C142	Electrolytic SG 1 uF	50 V M	3479310971 1
R825	Carbon Film 1.5 kohm 1/5 W J	3069152970	1	C143	Ceramic Tubular 1000 pF	50 V J	3519102935 1
R826	Carbon Film 10 kohm 1/5 W J	3069103970	1	C144/145	Electrolytic SG 1 uF	50 V M	3479310971 1
R827	Carbon Film 1 kohm 1/5 W J	3069102970	1	C146	Ceramic Tubular 680 pF	50 V J	3519681935 1
R828	Carbon Film 100 ohm 1/5 W J	3069101970	1	C147	Ceramic Disc 470 pF	50 V J	3579471130 1
R829/830	Carbon Film 100 kohm 1/5 W J	3069104970	2	C148	Ceramic Disc 27 pF	50 V J	3579150130 1
R831/832	Carbon Film 22 kohm 1/5 W J	3069223970	2	C149	Ceramic Disc 15 pF	50 V J	3579150130 1
R833/834	Carbon Film 1.8 kohm 1/5 W J	3069182970	2	C151	Ceramic Disc 8 pF	50 V D	3579809030 1
R835/836	Carbon Film 51 kohm 1/5 W J	3069513970	2	C152	Electric SG 33 uF	25 V M	3479332041 1
R837	Carbon Film 3.9 kohm 1/5 W J	3069392970	1	C153	Ceramic Disc 1000 pF	50 V J	3579102530 1
R838/839	Carbon Film 2.4 kohm 1/5 W J	3069242970	2	C154	Ceramic Disc 220 pF	50 V J	3579221130 1
R840/841	Carbon Film 3.3 kohm 1/5 W J	3069332970	2	C155	Mylar 0.047 uF	100 V J	3679473120 1
R842/843	Carbon Film 1 kohm 1/5 W J	3069102970	2	C156	Electrolytic SG 1 uF	50 V M	3479310971 1
R844/845	Carbon Film 3.3 kohm 1/5 W J	3069332970	2	C157	Ceramic Disc 220 pF	50 V J	3579221130 1
R850	Carbon Film 1 kohm 1/5 W J	3069102970	1	C159	Electrolytic SG 0.47 uF	50 V M	3479347871 1
R865	Carbon Film 4.7 kohm 1/5 W J	3069472970	1	C160	Ceramic Tubular 680 pF	50 V J	3519681935 1
R867	Carbon Film 10 kohm 1/5 W J	3069103970	1	C161	Ceramic Disc 470 pF	50 V J	3579471130 1
R868	Carbon Film 100 kohm 1/5 W J	3069104970	2	C162	Ceramic Disc 27 pF	50 V J	3579270130 1
R869	Carbon Film 1 kohm 1/5 W J	3069102970	1	C163	Electric SG 33 uF	25 V M	3479332041 1
R870	Carbon Film 5.6 kohm 1/5 W J	3069562970	1	C164	Ceramic Disc 8 pF	50 V D	3579809030 1
R888/889	Carbon Film 270 ohm 1/5 W J	3069221970	2	C166	Ceramic Disc 15 pF	50 V J	3579150130 1
R890/891	Carbon Film 220 ohm 1/5 W J	3069221970	2	C167	Ceramic Disc 1000 pF	50 V J	3579102530 1
R892-898	Carbon Film 270 ohm 1/5 W J	3069271970	7	C168/169	Ceramic Disc 220 pF	50 V J	3579221130 2
R899	Carbon Film 470 ohm 1/5 W J	3069471970	1	C170	Mylar 0.047 uF	100 V J	3679473120 1
<b>COILS</b>				C171	Electrolytic SG 1 uF	50 V M	3479310971 1
L801	Inductor, 20.8 mH	2648601430	1	C172	Mylar 0.047 uF	100 V J	3679473120 1
T801	AM ANT	2608201120	1	C176	Electrolytic SG 47 uF	25 V M	3479347041 1
T802	OSC., AM	2638201150	1	C178	Electrolytic SG 47 uF	25 V M	3479347041 1
T803	FM Quad DET(A)	2838501110	1	C179/C180	Ceramic Disc 27 pF	50 V J	3579270130 2
T804	FM Quad DET(B)	2838501210	1	C181/C182	Electrolytic SG 1 uF	100 V M	3479310971 2
T805	AM IFT, P-7SB	2848001250	1	C184	Mylar 0.1 uF	100 V J	3679104120 1
T806/807	MPX 19 k/38 kHz, Coil, Black	2658001050	2	C187	Ceramic Tubular 0.1 uF	50 V Z	3579104935 1
				C188	Ceramic Tubular 0.047 uF	50 V Z	3579473935 1
				C192	Ceramic Disc 0.0047 uF	50 V Z	3579472530 1
				CF111/112	Ceramic Disc 10 pF	50 V J	3579100130 2

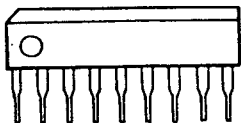
Ref. No.	Description	Mfr. Part No.	Q'ty	Ref. No.	Description	Mfr. Part No.	Q'ty
<b>CONNECTORS</b>							
CN101	Lead Ass'y 300mm 9P	436109303331	1	R141	Carbon Film	12 kohm 1/5 W J	3069123970 1
CN102	Lead Ass'y 160mm 15P	436215163332	1	R142	Carbon Film	10 kohm 1/5 W J	3069103970 1
CN103	Lead Ass'y 460mm 7P	436107463331	1	R143	Carbon Film	270 kohm 1/5 W J	3069274970 1
CN104	Lead Ass'y 300mm 4P	436104308331	1	R144	Carbon Film	100 kohm 1/5 W J	3069104970 1
CN108	Lead Ass'y 440mm 2P	436402443231	1	R145	Carbon Film	470 ohm 1/5 W J	3069471970 1
CN109	Lead Ass'y 220mm 2P	436102223331	1	R146	Carbon Film	3.3 kohm 1/5 W J	3069332970 1
CN110	Lead Ass'y 260mm 5P	436105263331	1	R147	Carbon Film	39 kohm 1/5 W J	3069393970 1
CP105	Wafer 8P GD	4428550080	1	R148	Carbon Film	680 ohm 1/5 W J	3069681970 1
CP106	Wafer 8P GD	4428550080	1	R149/150	Carbon Film	10 kohm 1/5 W J	3069103970 2
CP107	Wafer 6P GD	4428550060	1	R151/152	Metal Film	4.3 kohm 1/5 W J	3029432970 2
CP204	Wafer 3P AC	4428525790	1	R153	Carbon Film	43 kohm 1/5 W J	3069433970 1
CP207	Wafer 1P AC	4428525860	1	R154	Carbon Film	1.8 kohm 1/5 W J	3069182970 1
CP401	Wafer, FPC, 25P	4428526370	1	R155	Carbon Film	39 kohm 1/5 W J	3069393970 1
CP701	Wafer 8P	4428505510	1	R156	Carbon Film	3.3 kohm 1/5 W J	3069332970 1
CP702	Wafer 6P	4428505810	1	R157	Carbon Film	100 kohm 1/5 W J	3069104970 1
<b>DIODES</b>				R158	Carbon Film	1 kohm 1/5 W J	3069102970 1
D101-104	1N4148M, Switching	2058322101	4	R159	Carbon Film	120 ohm 1/5 W J	3069121970 1
D106-108	1N4148M, Switching	2058322101	3	R160	Carbon Film	1 kohm 1/5 W J	3069102970 1
D110/111	1N4148M, Switching	2058322101	2	R161	Carbon Film	2.7 kohm 1/5 W J	3069272970 1
D116/117	1N4148M, Switching	2058322101	2	R162	Carbon Film	120 ohm 1/5 W J	3069121970 1
<b>INTEGRATED CIRCUITS</b>				R163	Carbon Film	220 ohm 1/5 W J	3069221970 1
IC101/102	LC7821	2168017132	2	R164/165	Cement	0.27 ohm 3 W K	3059278682 2
IC103	KIA6259P	2168206107	1	R166	Carbon Film	470 ohm 1/5 W J	3069471970 1
IC104/105	KIA7559P/KIA4559P	2168206104	2	R167	Carbon Film	4.7 kohm 1/5 W J	3069472970 1
IC106	LTV817, Photo-Coupler	2408000136	1	R168	Carbon Film	15 kohm 1/5 W J	3069153970 1
<b>TRANSISTORS</b>				R171	Carbon Film	39 kohm 1/5 W J	3069393970 1
Q101-104	KTC1815Y/BKTC3198Y, NPN	2208606104	4	R172/173	Carbon Film	10 kohm 1/5 W J	3069103970 2
Q105	DTA114Y/KRA107M, PNP	2238006103	1	R174	Carbon Film	680 ohm 1/5 W J	3069681970 1
Q106/107	KTC2240/BKTC3200, NPN	2208606108	2	R175	Carbon Film	100 kohm 1/5 W J	3069104970 1
Q108/109	KTC1815Y/BKTC3198Y, NPN	2208606104	2	R176	Carbon Film	3.3 kohm 1/5 W J	3069332970 1
Q110	BKTA949/KTA1024, PNP	2208206102	1	R177/178	Carbon Film	4.3 kohm 1/5 W J	3069432970 2
Q111	KTC2229/KTC3206, NPN	2208606107	1	R179	Carbon Film	43 kohm 1/5 W J	3069433970 1
Q112	2SC4137, Bias, NPN	2008622110	1	R180	Carbon Film	1.8 kohm 1/5 W J	3069182970 1
Q113	BKTC2235/KTC1027, NPN	2228406120	1	R181	Carbon Film	39 kohm 1/5 W J	3069393970 1
Q114	BKTA965/KTA1023, PNP	2208206114	1	R182	Carbon Film	120 ohm 1/5 W J	3069121970 1
Q115	2SC3854, NPN	2028416107	1	R183	Carbon Film	2.7 kohm 1/5 W J	3069272970 1
Q116	2SA1490, PNP	2028116104	1	R184	Carbon Film	1 kohm 1/5 W J	3069102970 1
Q117/118	KTC2240/BKTC3200, NPN	2208606108	2	R185	Carbon Film	120 ohm 1/5 W J	3069121970 1
Q119/120	KTC1815Y/BKTC3198Y, NPN	2208606104	2	R186	Carbon Film	220 ohm 1/5 W J	3069221970 1
Q121	BKTA949/KTA1024, PNP	2208206102	1	R187/188	Cement	0.27 ohm 3 W K	3059278682 2
Q122	KTC2229/KTC3206, NPN	2208606107	1	R189	Carbon Film	270 ohm 1/5 W J	3069271970 1
Q123	2SC4137, Bias, NPN	2008622110	1	R190	Carbon Film	4.7 kohm 1/5 W J	3069472970 1
Q124	BKTC2235/KTC1027, NPN	2228406120	1	R191	Carbon Film	15 kohm 1/5 W J	3069153970 1
Q125	BKTA965/KTA1023, PNP	2208206114	1	R192	Carbon Film	10 ohm 1/5 W J	3069100970 1
Q126	2SC3854, NPN	2028416107	1	R193	Carbon Film	10 ohm 1/4 W J	3069100270 1
Q127	2SA1490, PNP	2028116104	1	R194	Carbon Film	24 kohm 1/5 W J	3069243970 1
Q128/129	KTC1815Y/BKTC3198Y, NPN	2208606104	2	R196	Carbon Film	3.9 kohm 1/5 W J	3069392970 1
Q130	DTA114Y/KRA107M, PNP	2238006103	1	R197	Carbon Film	47 ohm 1/5 W J	3069470970 1
<b>RESISTORS</b>				R198	Carbon Film	47 kohm 1/5 W J	3069473970 1
R101L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	R199	Carbon Film	270 ohm 1/5 W J	3069271970 1
R102L/R	Carbon Film	91 kohm 1/5 W J	3069913970 2	R201	Carbon Film	1 kohm 1/5 W J	3069102970 1
R103L/R	Carbon Film	91 kohm 1/5 W J	3069913970 2	R202	Carbon Film	1 kohm 1/5 W J	3069102970 1
R104L/R	Carbon Film	820 ohm 1/5 W J	3069821970 2	<b>MISCELLANEOUS</b>			
R105L/R	Carbon Film	560 kohm 1/5 W J	3069564970 2	32	Jack, RCA, 4P	4438108110	1
R106L/R	Carbon Film	43 kohm 1/5 W J	3069433970 2	35	Jack, RCA, 6P	4438103210	1
R107/108	Carbon Film	47 ohm 1/5 W J	3069470970 2	38	Terminal, Speaker, 6P	4408106410	1
R109L/R	Carbon Film	470 ohm 1/5 W J	3069471970 2	39	jack, Multi	4438006510	1
R110L/R	Carbon Film	100 kohm 1/5 W J	3069104970 2	58	Jack, RCA, 4P, with Ground	4438108010	1
R111L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	G1	Ground Plate	4235007310	1
R112L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	<b>PCB11 ASSEMBLY P.C. BOARD SURROUND</b>			
R113L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	<b>CAPACITORS</b>			
R114L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C501	Electrolytic SG	10 uF 50 V M	3479310071 1
R115L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C502	Electrolytic SG	47 uF 25 V M	3479347041 1
R116L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C503-505	Electrolytic SG	10 uF 50 V M	3479310071 3
R117L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C506	Electrolytic SG	47 uF 25 V M	3479347041 1
R118L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C507/508	Electrolytic SG	10 uF 50 V M	3479310071 2
R119L/R	Carbon Film	1 kohm 1/5 W J	3069102970 2	C509/510	Electrolytic SG	47 uF 25 V M	3479347041 2
R120	Carbon Film	470 ohm 1/5 W J	3069471970 1	C511	Ceramic Tubular	100 pF 50 V J	3519101935 1
R120L/R	Carbon Film	47 kohm 1/5 W J	3069473970 2	C512	Electrolytic SG	1 uF 50 V M	3479310971 1
R121	Carbon Film	470 ohm 1/5 W J	3069471970 1	C513	Electrolytic SG	0.47 uF 50 V M	3479347871 1
R122L/R	Carbon Film	100 kohm 1/5 W J	3069104970 2	C514	Electrolytic SG	47 uF 25 V M	3479347041 1
R123-126	Carbon Film	470 ohm 1/5 W J	3069471970 4	C515	Ceramic Tubular	680 pF 50 V J	3519681935 1
R127	Carbon Film	100 kohm 1/5 W J	3069104970 1	C516	Electrolytic SG	1 uF 50 V M	3479310971 1
R128/129	Carbon Film	1 kohm 1/5 W J	3069102970 2	C517	Electrolytic SG	47 uF 25 V M	3479347041 1
R130	Carbon Film	100 kohm 1/5 W J	3069104970 1	C518	Electrolytic SG	1 uF 50 V M	3479310971 1
R131	Carbon Film	12 kohm 1/5 W J	3069123970 1	C519	Ceramic Tubular	680 pF 50 V J	3519681935 1
R132	Carbon Film	2 kohm 1/5 W J	3069202970 1	C520	Electrolytic SG	1 uF 50 V M	3479310971 1
R133	Carbon Film	100 kohm 1/5 W J	3069104970 1	C521	Ceramic Tubular	100 pF 50 V J	3519101935 1
R134	Carbon Film	470 ohm 1/5 W J	3069471970 1	C522	Mylar	0.1 uF 63 V J	3679104297 1
R135	Carbon Film	3.3 kohm 1/5 W J	3069332970 1	C523	Mylar	0.022 uF 100 V J	3679223120 1
R136	Carbon Film	2.2 kohm 1/5 W J	3069222970 1	C524/525	Electrolytic SG	4.7 uF 50 V M	3479347971 2
R137/138	Carbon Film	470 ohm 1/5 W J	3069471970 2	C526-528	Mylar	0.22 uF 63 V J	3679224297 3
R139	Carbon Film	100 kohm 1/5 W J	3069104970 1	C529	Mylar	0.68 uF 63 V J	3679684297 1
R140	Carbon Film	2 kohm 1/5 W J	3069202970 1	C530	Poly	470 pF 50 V J	3619471110 1
				C531	Mylar	0.047 uF 100 V J	3679473120 1
				C532	Mylar	0.0022 uF 100 V J	3679222120 1

Ref. No.	Description			Mfr. Part No.	Q'ty	Ref. No.	Description			Mfr. Part No.	Q'ty
C533	Electrolytic SG	1 uF	50 V M	3479310971	1	R536-538	Carbon Film	100 kohm	1/5 W J	3069104970	3
C534	Electrolytic SG	220 uF	16 V M	3479322131	1	R539	Carbon Film	47 ohm	1/5 W J	3069470970	1
C535	Mylar	0.0056 uF	100 V J	3679562120	1	R540/541	Carbon Film	100 kohm	1/5 W J	3069104970	2
C536/537	Electrolytic SG	1 uF	50 V M	3479310971	2	R542	Carbon Film	47 kohm	1/5 W J	3069473970	1
C538	Electrolytic SG	220 uF	16 V M	3479322131	1	R543	Carbon Film	7.5 kohm	1/5 W J	3069752970	1
C539	Electrolytic SG	10 uF	50 V M	3479310071	1	R544	Carbon Film	47 kohm	1/5 W J	3069473970	1
C540	Electrolytic SG	0.22 uF	50 V K	3479322871	1	R545	Carbon Film	15 kohm	1/5 W J	3069153970	1
C541-543	Electrolytic SG	1 uF	50 V M	3479310971	3	R546	Carbon Film	7.5 kohm	1/5 W J	3069752970	1
C544-546	Mylar	0.1 uF	63 V J	3679104297	3	R547	Carbon Film	47 kohm	1/5 W J	3069473970	1
C547/548	Mylar	0.22 uF	63 V J	3679224297	2	R548	Carbon Film	15 kohm	1/5 W J	3069153970	1
C549	Mylar	0.1 uF	63 V J	3679104297	1	R549	Carbon Film	22 kohm	1/5 W J	3069223970	1
C550	Mylar	0.047 uF	100 V J	3679473120	1	R550	Carbon Film	10 Mohm	1/5 W J	3069106970	1
C551	Poly	680 pF	50 V J	3619681110	1	R551	Carbon Film	22 kohm	1/5 W J	3069223970	1
C552	Mylar	0.1 uF	63 V J	3679104297	1	R552	Carbon Film	100 kohm	1/5 W J	3069104970	1
C553	Poly	680 pF	50 V J	3619681110	1	R553	Carbon Film	8.2 kohm	1/5 W J	3069822970	1
C554	Mylar	0.047 uF	100 V J	3679473120	1	R554	Carbon Film	7.5 kohm	1/5 W J	3069752970	1
C555	Electrolytic SG	10 uF	35 V M	3479310061	1	R555	Carbon Film	56 ohm	1/5 W J	3069560970	1
C556	Electrolytic SG	1 uF	50 V M	3479310971	1	R556	Carbon Film	18 kohm	1/5 W J	3069183970	1
C557/558	Mylar	0.1 uF	63 V J	3679104297	2	R557	Carbon Film	5.6 kohm	1/5 W J	3069562970	1
C559	Electrolytic SG	1 uF	50 V M	3479310971	1	R558	Carbon Film	22 ohm	1/5 W J	3069220970	1
C560	Electrolytic SG	10 uF	35 V M	3479310061	1	R559	Carbon Film	15 kohm	1/5 W J	3069153970	1
C561	Mylar	0.0047 uF	100 V J	3679472120	1	R560	Carbon Film	22 ohm	1/5 W J	3069220970	1
C562	Electrolytic SG	22 uF	50 V M	3479322071	1	R561	Carbon Film	18 kohm	1/5 W J	3069183970	1
C563	Mylar	0.0056 uF	100 V J	3679562120	1	R562	Carbon Film	15 kohm	1/5 W J	3069153970	1
C564	Electrolytic SG	100 uF	10 V M	3479310121	1	R563	Carbon Film	47 ohm	1/5 W J	3069470970	1
C565	Ceramic Disc	0.1 uF	50 V Z	3579104534	1	R564	Carbon Film	1 Mohm	1/5 W J	3069105970	1
C566	Mylar	0.0056 uF	100 V J	3679562120	1	R565-567	Carbon Film	1 kohm	1/5 W J	3069102970	3
C567	Ceramic Disc	470 pF	50 V J	3579471130	1	R569	Carbon Film	470 ohm	1/5 W J	3069471970	1
C568	Mylar	0.1 uF	63 V J	3679104297	1	R570	Carbon Film	1 kohm	1/5 W J	3069102970	1
C569	Electrolytic SG	47 uF	25 V M	3479347041	1	R571/572	Carbon Film	1 kohm	1/5 W J	3069102970	2
C570/571	Mylar	0.047 uF	100 V J	3679473120	2	R573	Carbon Film	100 ohm	1/5 W J	3069101970	1
C572	Mylar	0.1 uF	63 V J	3679104297	1						
C573	Mylar	0.0033 uF	100 V J	3679332120	1						
C574	Ceramic Disc	470 pF	50 V J	3579471130	1	X501	RESONATOR			3938124001	1
C575	Electrolytic SG	47 uF	16 V M	3479347031	1		CSA2.00MG-TF01				
C576/577	Ceramic Disc	270 pF	100 V J	3579271130	2						
C578	Ceramic Tubular	100 pF	50 V J	3519101935	1						
C582	Electrolytic SG	47 uF	25 V M	3479347041	1						
C583	Ceramic Disc	0.01 uF	50 V Z	3519103935	1						
C584	Ceramic Tubular	100 pF	50 V J	3519101935	1						
C585	Electrolytic SG	100 uF	10 V M	3479310121	1						
CONNECTORS											
CNT106	Wafer 8P			4428560080	1						
CNT107	Wafer 6P			4428560080	1						
CNT602	Wafer 9P			4428507010	1						
DIODES											
D501-503	1N4148M, Switching			2058322101	3						
INTEGRATED CIRCUITS											
IC501/502	KIA7559S/KIA4559S			2168206103	2						
IC503/504	LC4966			2138017108	2						
IC505	KIA7559P/KIA4559P			2168206104	1						
IC506	TC9176P			2138007124	1						
IC507	NJM2177L			2168020115	1						
IC508	NJU9701D			2168020114	1						
IC509	MC14094BCP			2138009115	1						
TRANSISTORS											
Q501/502	DTA114Y/KRA107M, PNP			2238006103	2						
Q503/504	DTC114YS, NPN			2208622106	2						
Q505/506	DTA114Y/KRA107M, PNP			2238006103	2						
Q507/508	DTC114YS, NPN			2208622106	2						
RESISTORS											
R501	Carbon Film	100 ohm	1/5 W J	3069101970	1						
R502/503	Carbon Film	100 kohm	1/5 W J	3069104970	2						
R504	Carbon Film	100 ohm	1/5 W J	3069101970	1						
R505-508	Carbon Film	100 kohm	1/5 W J	3069104970	4						
R510/511	Carbon Film	150 kohm	1/5 W J	3069154970	2						
R512/513	Carbon Film	100 ohm	1/5 W J	3069101970	2						
R514/515	Carbon Film	22 kohm	1/5 W J	3069223970	2						
R516	Carbon Film	120 kohm	1/5 W J	3069124970	1						
R517	Carbon Film	10 kohm	1/5 W J	3069103970	1						
R518	Carbon Film	100 kohm	1/5 W J	3069104970	1						
R519	Carbon Film	100 ohm	1/5 W J	3069101970	1						
R520	Carbon Film	47 kohm	1/5 W J	3069473970	1						
R521	Carbon Film	3.6 kohm	1/5 W J	3069362970	1						
R522	Carbon Film	560 kohm	1/5 W J	3069564970	1						
R523	Carbon Film	1.8 kohm	1/5 W J	3069182970	1						
R524	Carbon Film	100 ohm	1/5 W J	3069101970	1						
R525	Carbon Film	100 kohm	1/5 W J	3069104970	1						
R526	Carbon Film	4.7 kohm	1/5 W J	3069472970	1						
R527	Carbon Film	1.8 kohm	1/5 W J	3069182970	1						
R528	Carbon Film	560 kohm	1/5 W J	3069564970	1						
R529-531	Carbon Film	1 kohm	1/5 W J	3069102970	3						
R532	Carbon Film	330 kohm	1/5 W J	3069334970	1						
R533-535	Carbon Film	15 kohm	1/5 W J	3069153970	3						

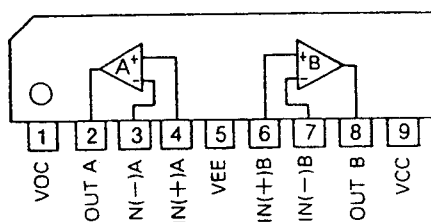
# SEMICONDUCTOR LEAD IDENTIFICATION & INTERNAL DIAGRAM

KIA4559S : IC501, IC502, IC701  
(KIA7559)

Package Outline

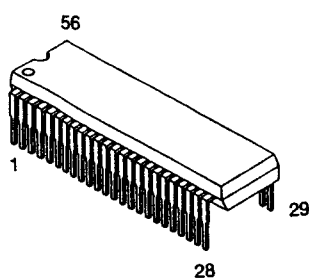


Block Diagram

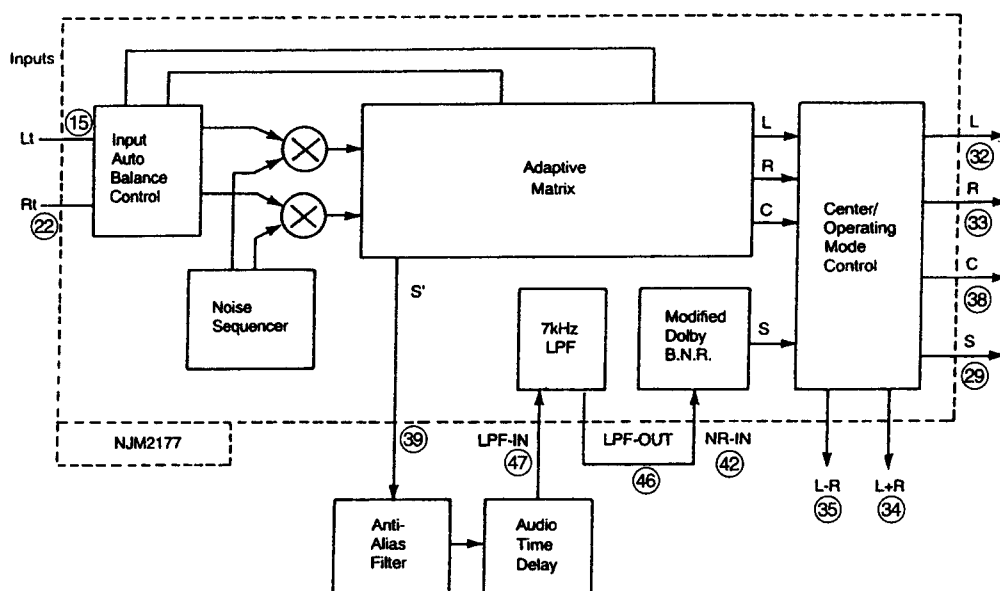


NJM2177 : IC507

Package Outline

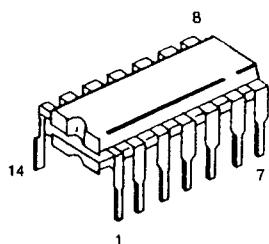


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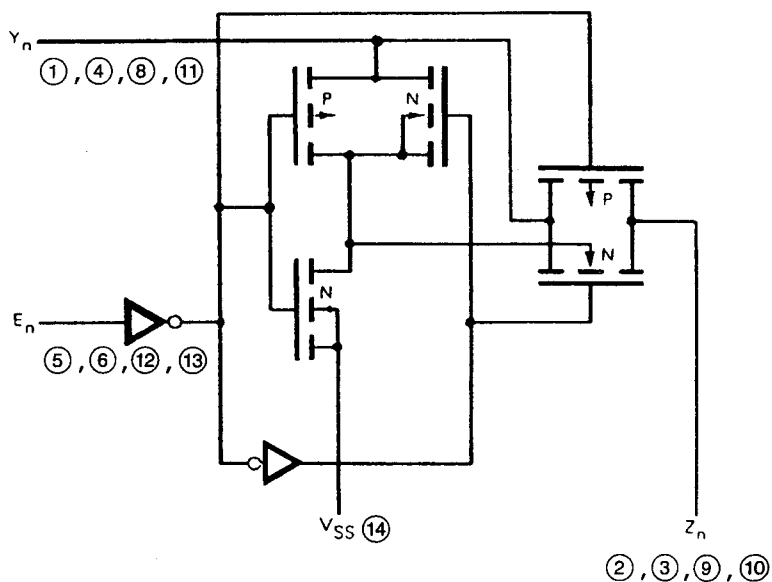


GD4066 : IC301

Package Outline

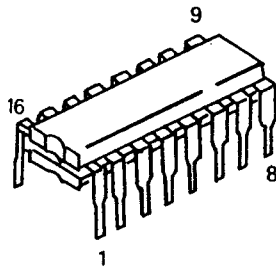


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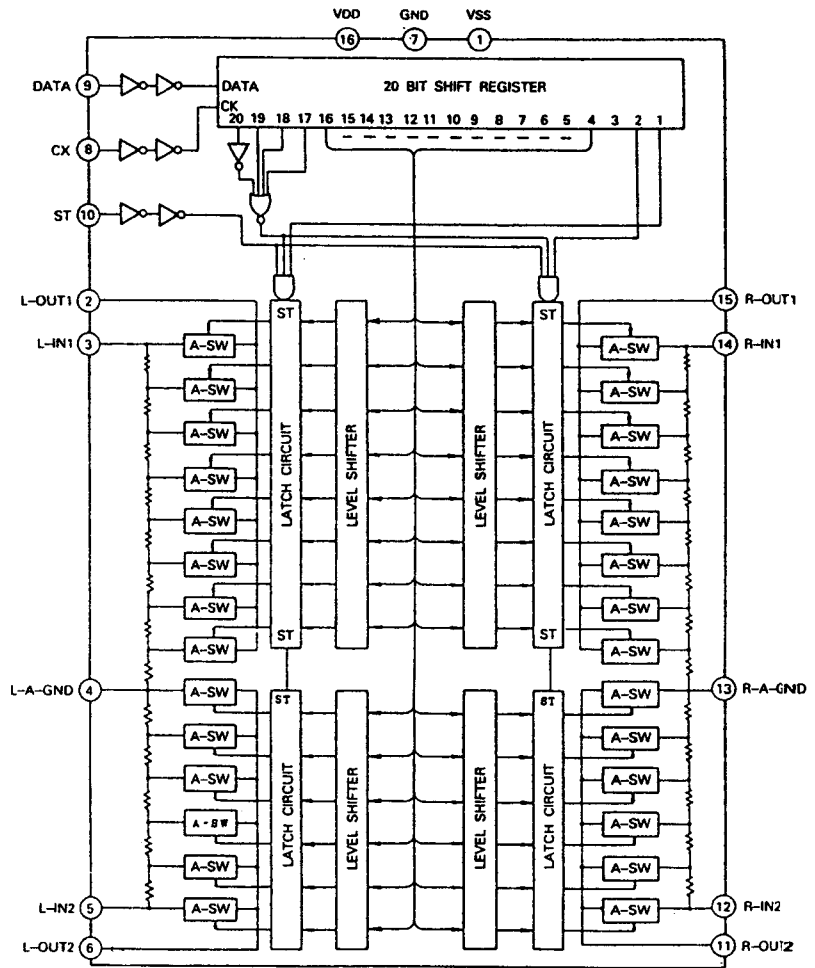


# TC9176 : IC506

## Package Outline

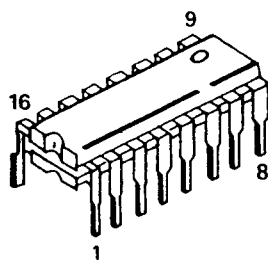


## Block Diagram

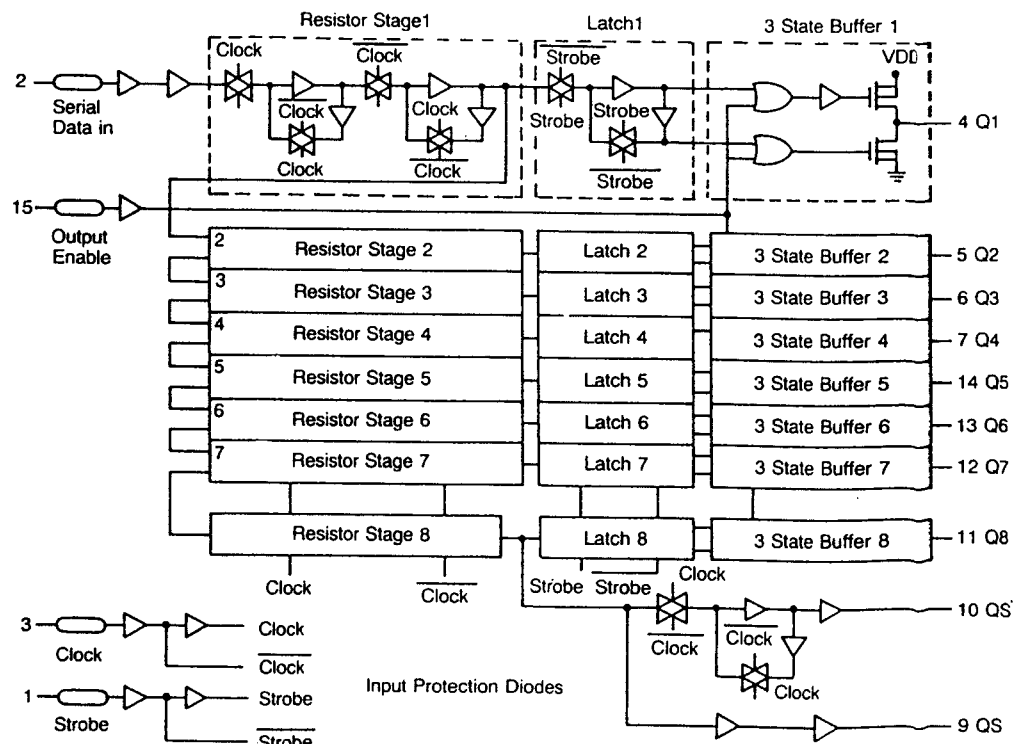


# MC14094 : IC509

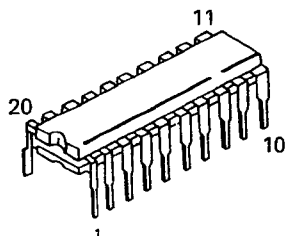
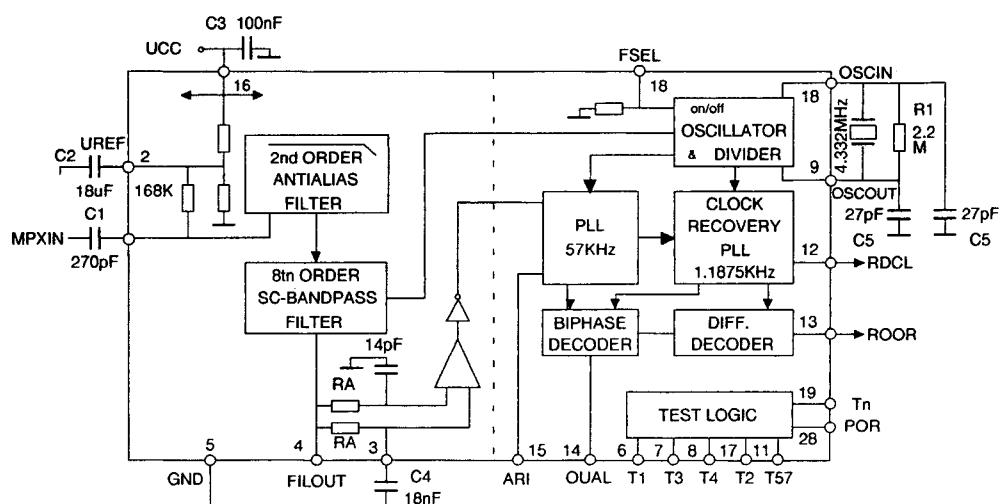
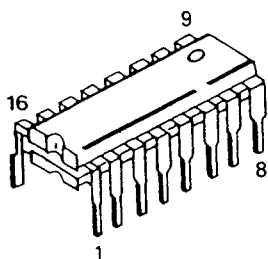
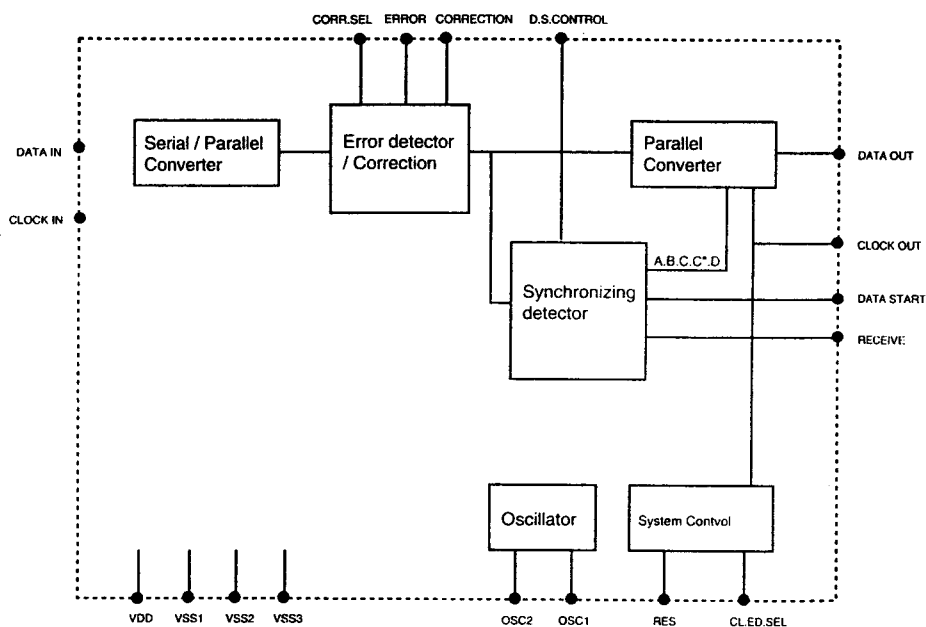
## Package Outline



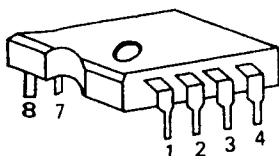
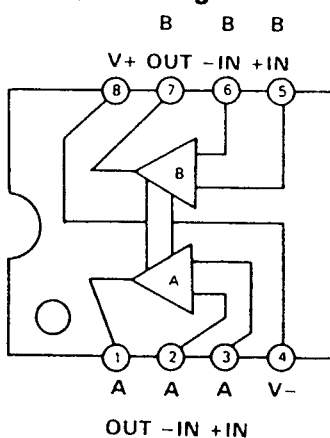
## Block Diagram





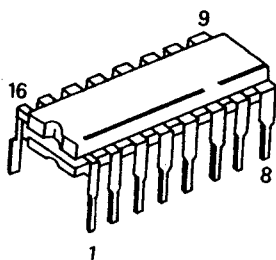
**TDA7330B : IC805****Package Outline****Block Diagram****LC7073 : IC806****Package Outline****Block Diagram****(KIA 4559P)**

**(KIA 6259P : IC103, IC104, IC105,  
IC601, IC602, IC505)**

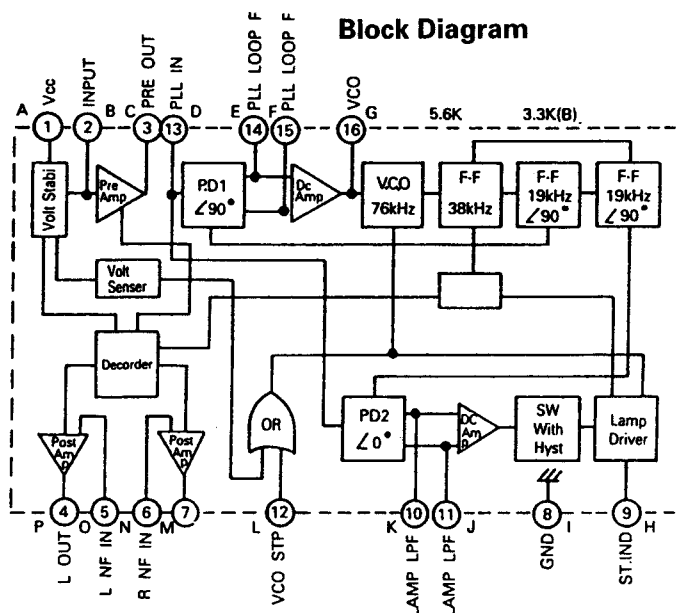
**Package Outline****Block Diagram**

# HA12016 : IC803

## Package Outline

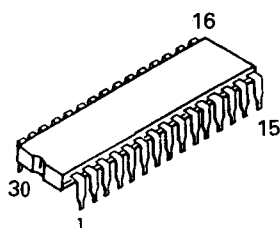


## Block Diagram

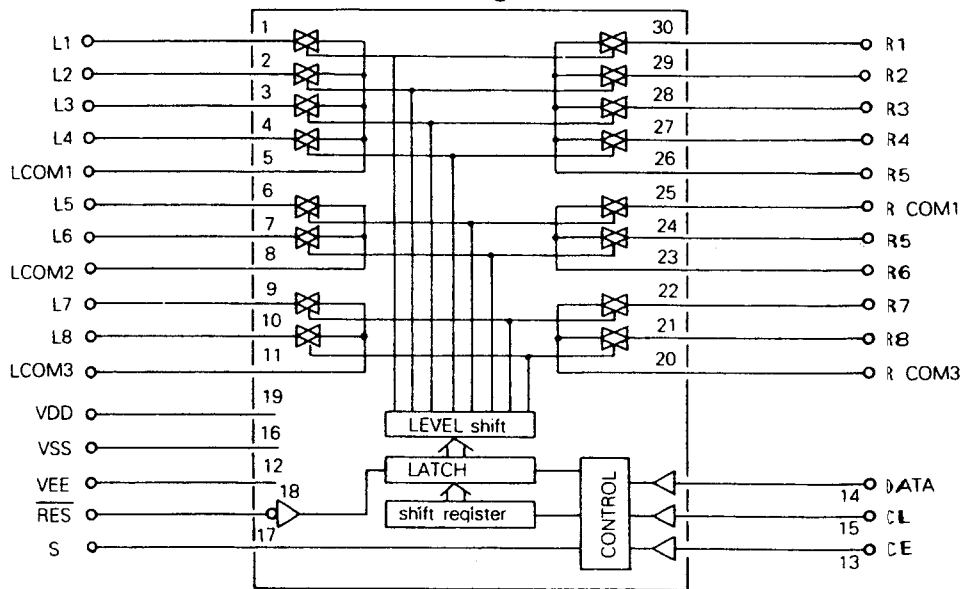


# LC7821 : IC101, IC102

## Package Outline

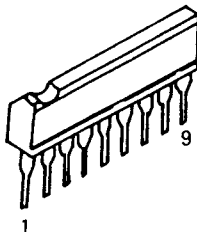


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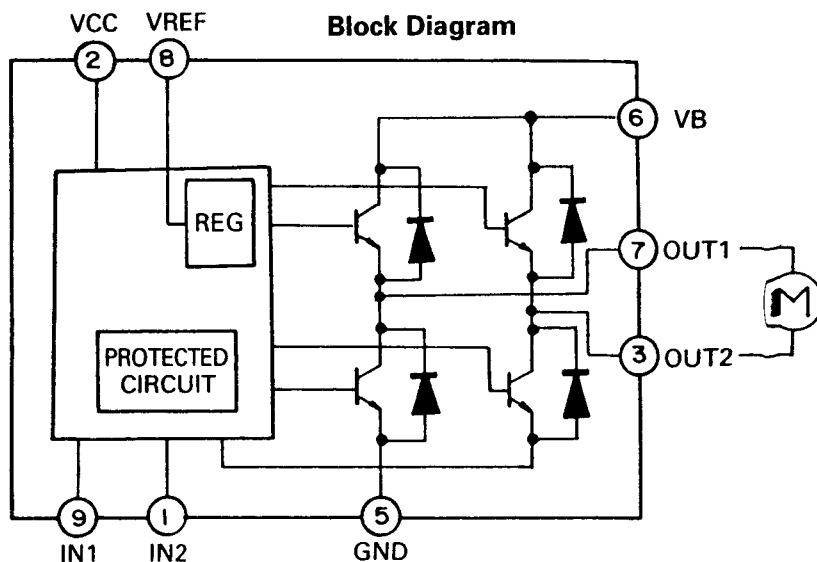


# TA7291S : IC603

## Package Outline

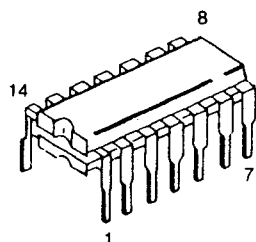


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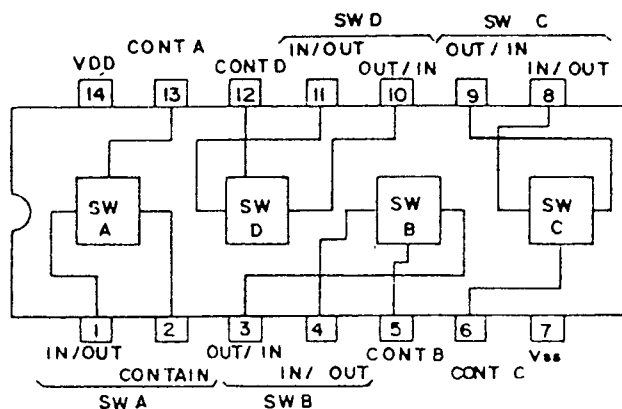


# LC4966B : IC503, IC504

## Package Outline

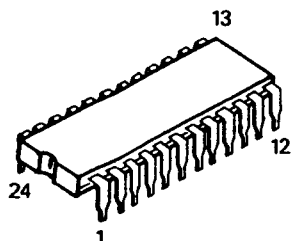


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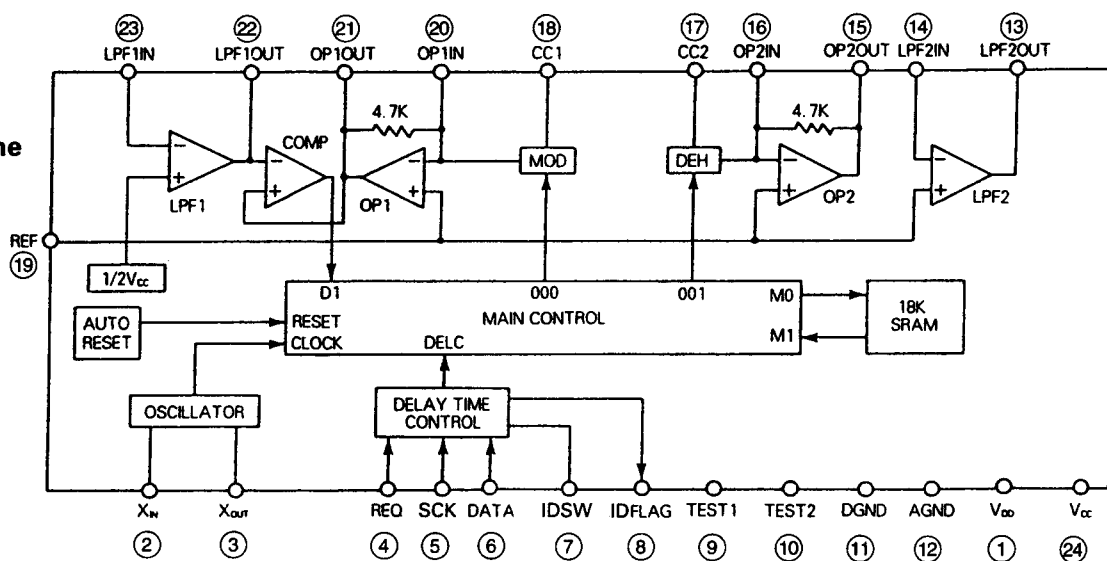


# NJU9701 : IC508

## Package Outline

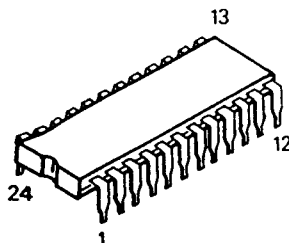


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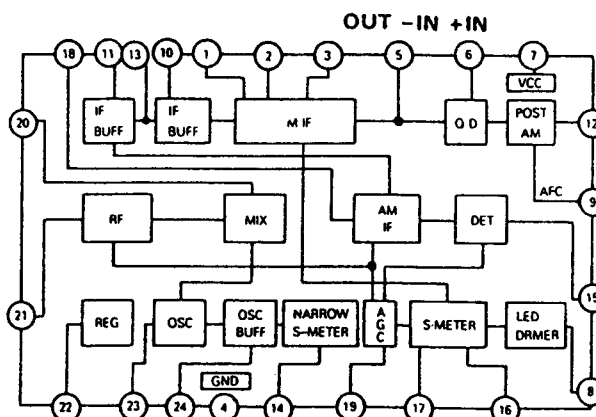


# LA1266 : IC801

## Package Outline

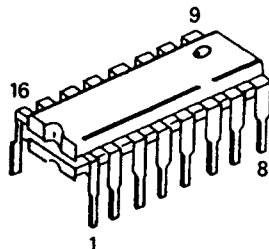


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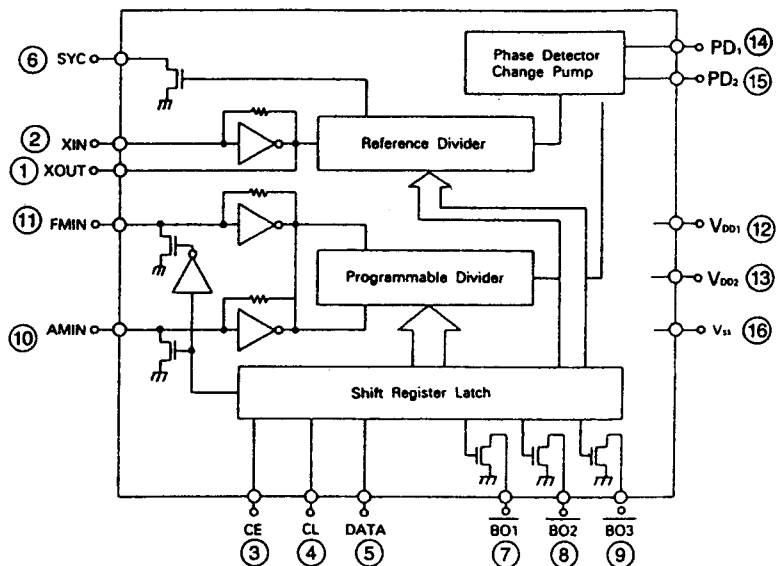


# LM7001 : IC802

## Package Outline

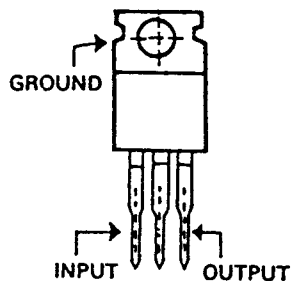


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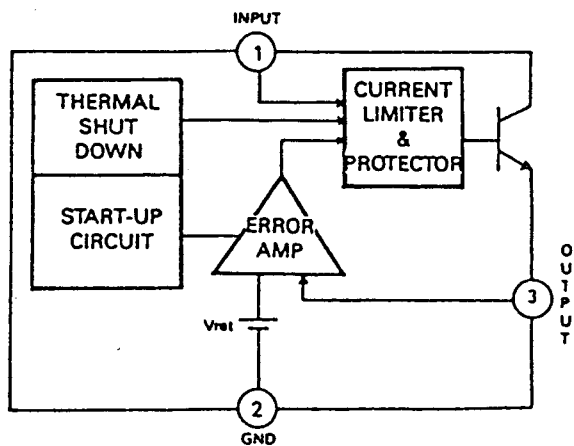


# GD78XX : IC105

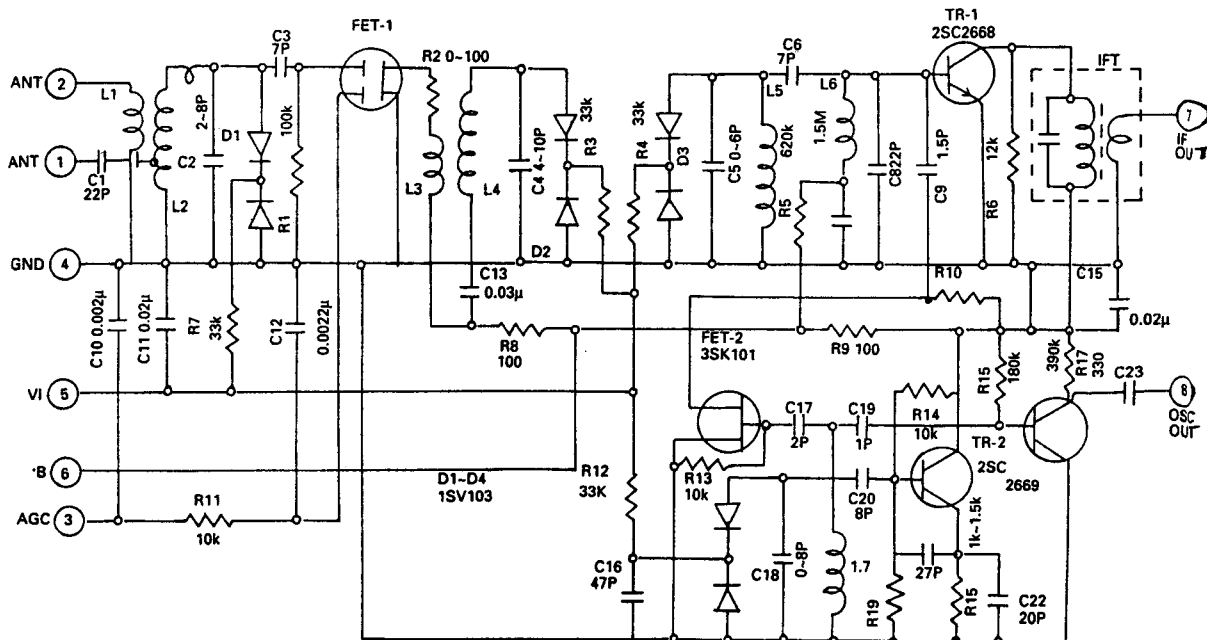
## Front View






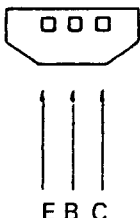



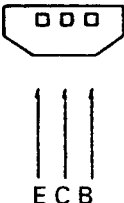




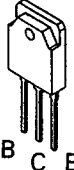

## Block Diagram



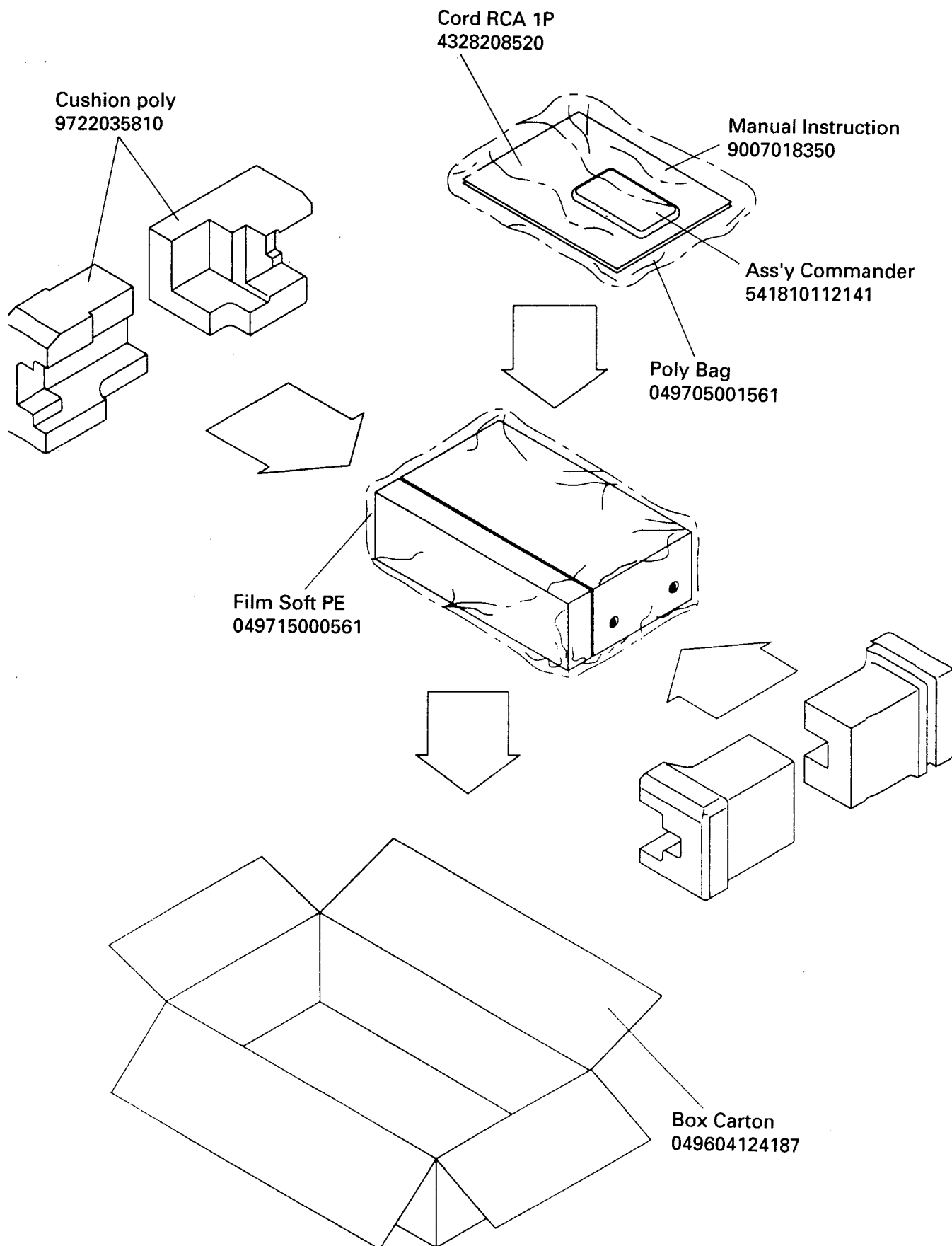
# FE407-G6 : FE1



## TRANSISTORS LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
KTD1302 KTC3200/KTC2240 KTC3198/KTC1815 KTC1923/KTC3194 KTA2400 KTA1268/KTA970 KTA1266/KTA1015		
DTC114YS DTA114YS		
MPSA06 MPSA56		
KTA1024 KTC3206		
2SC4137 2SC4883 2SA1859		
2SK168D		
2SA1265N-O 2SC3182N-O		
TERMINAL NAME		
D→DRAIN G→GATE S→SOURCE		B→BASE C→COLLECTOR E→EMITTER

# PACKAGE



# WIRING DIAGRAM

A

B

C

D

E

F

G

1

2

3

4

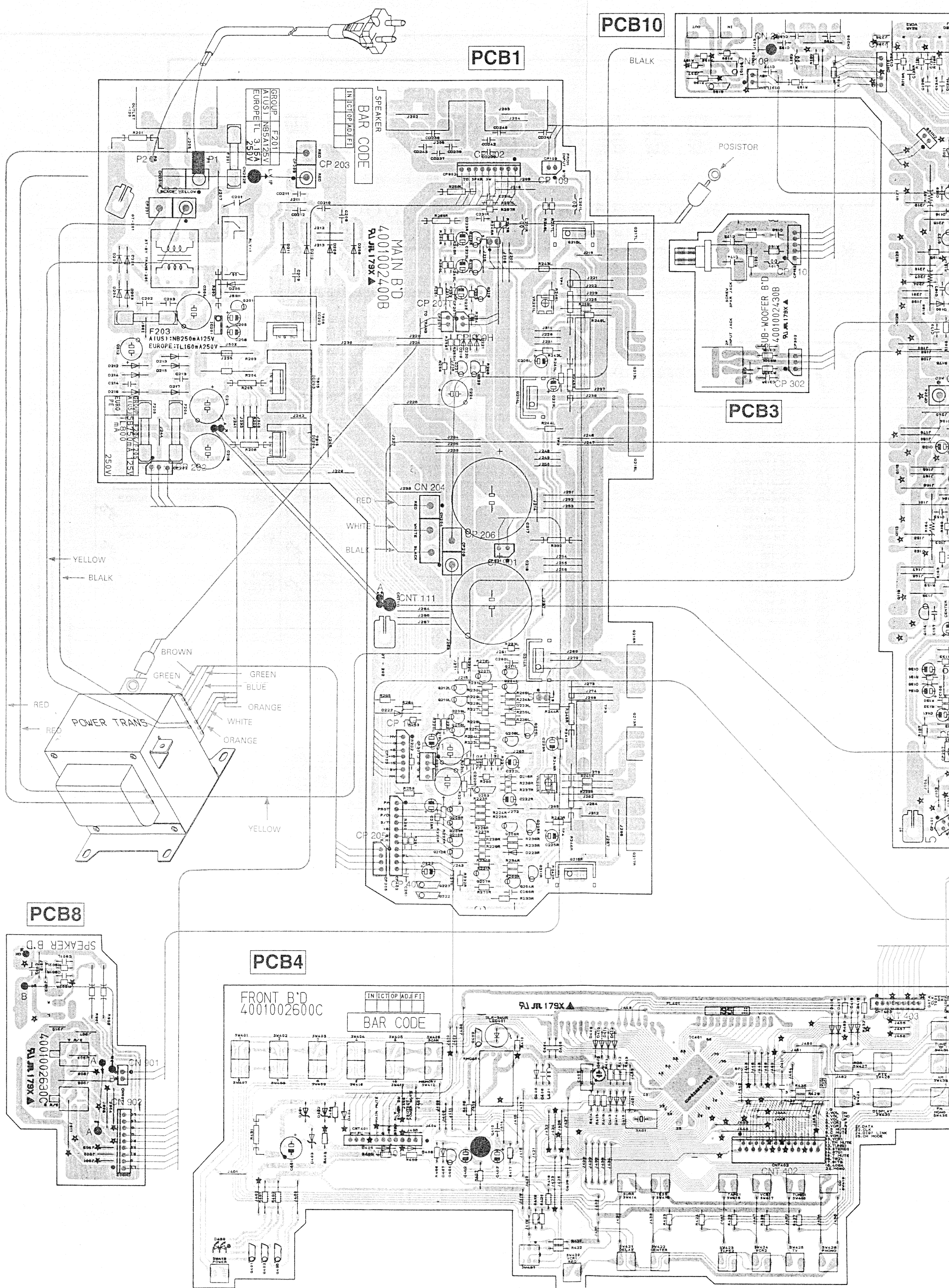
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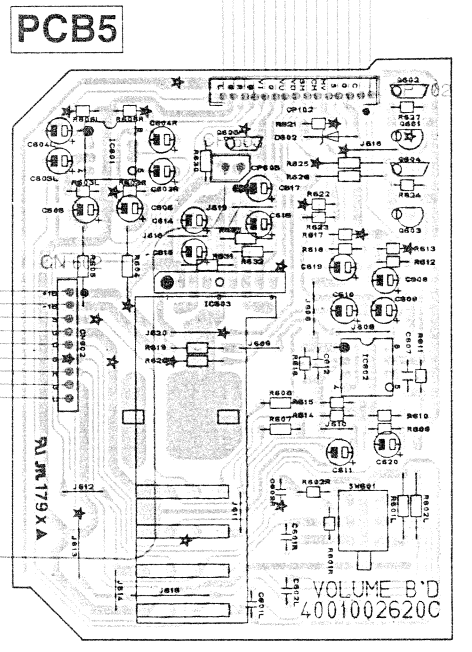
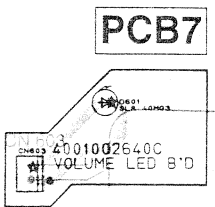
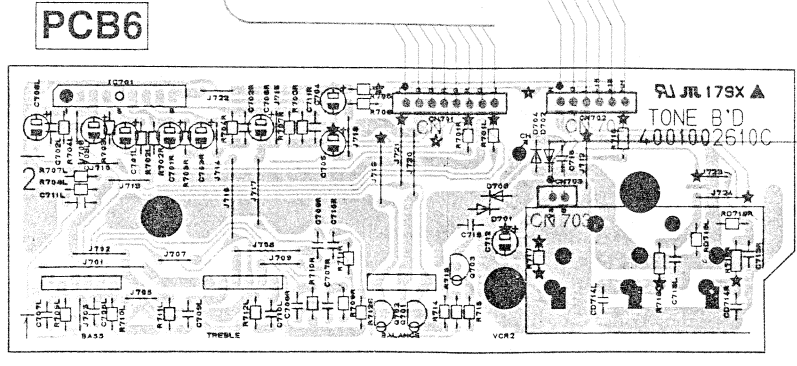
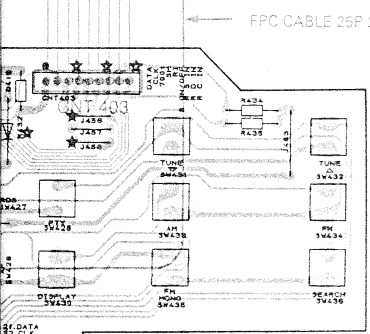
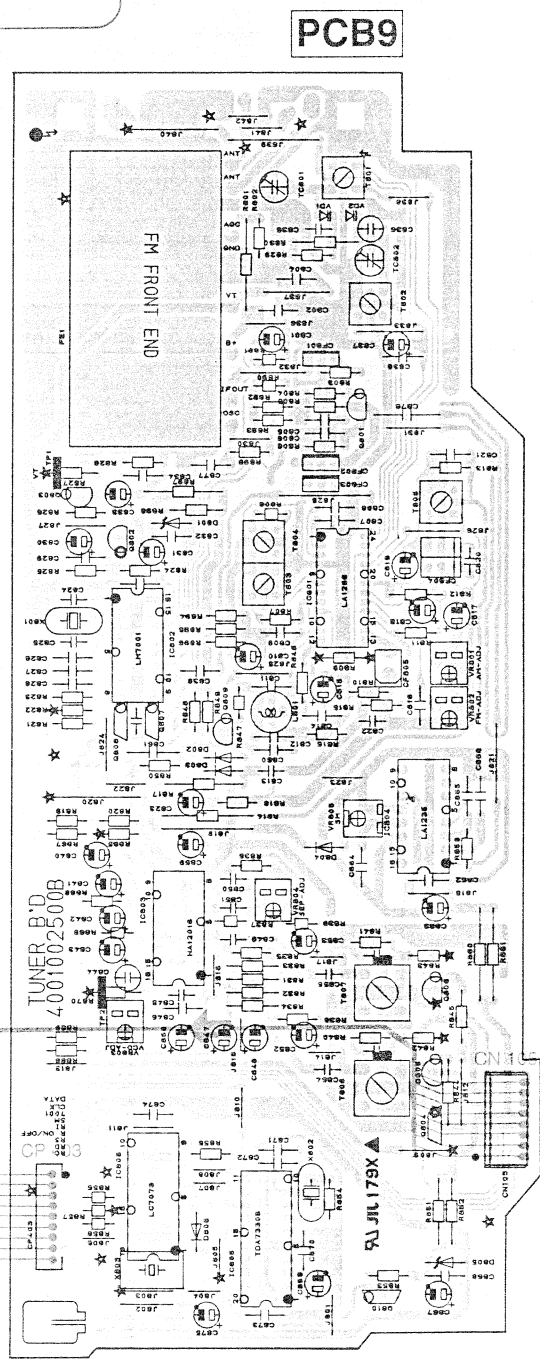
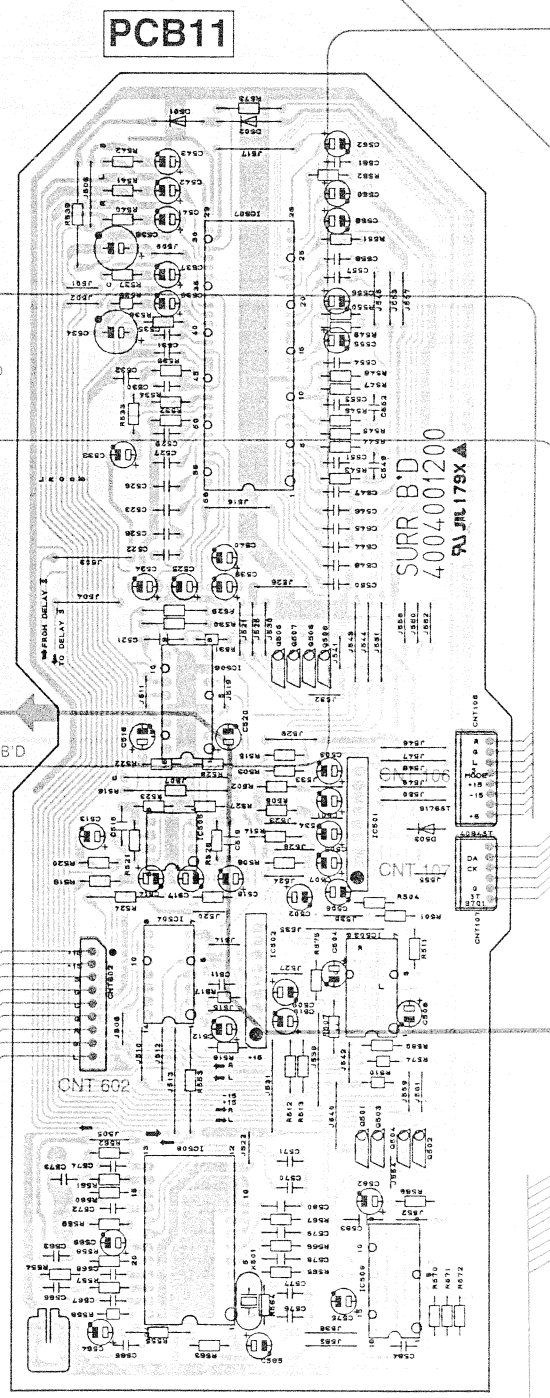
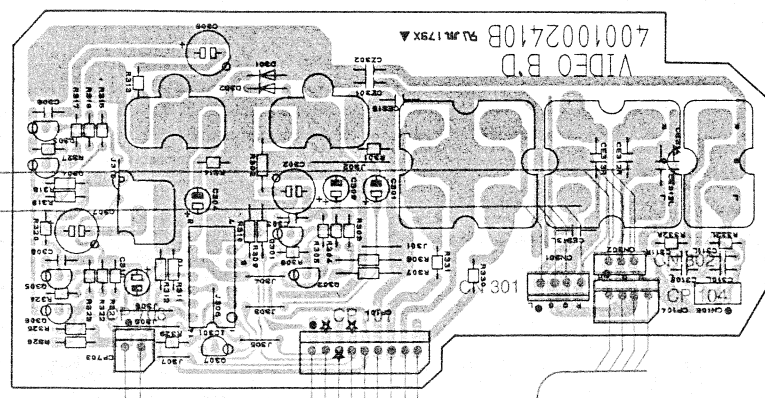
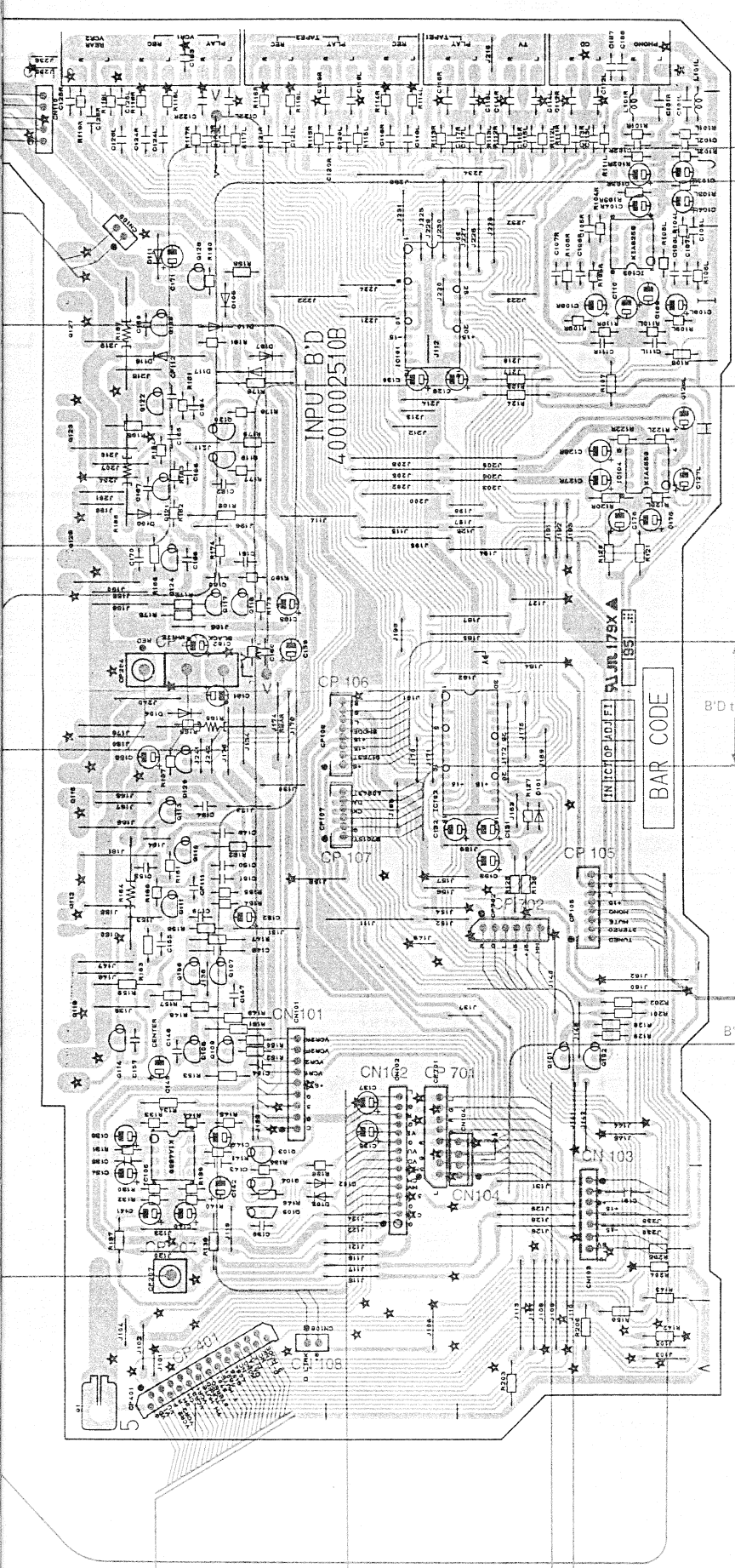
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9



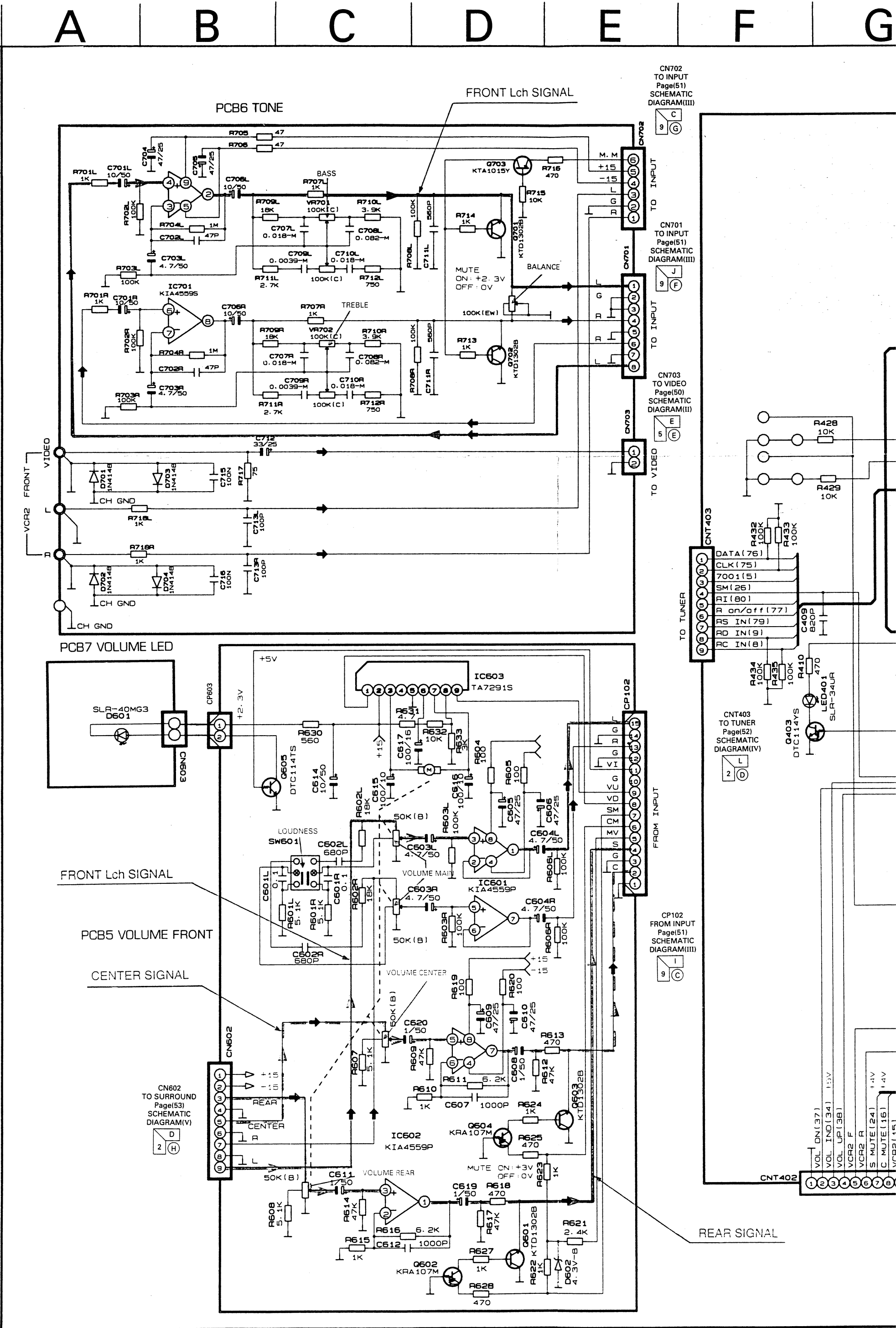


G | H | I | J | K | L | M





SCHEMATIC DIAGRAM I



G

H

I

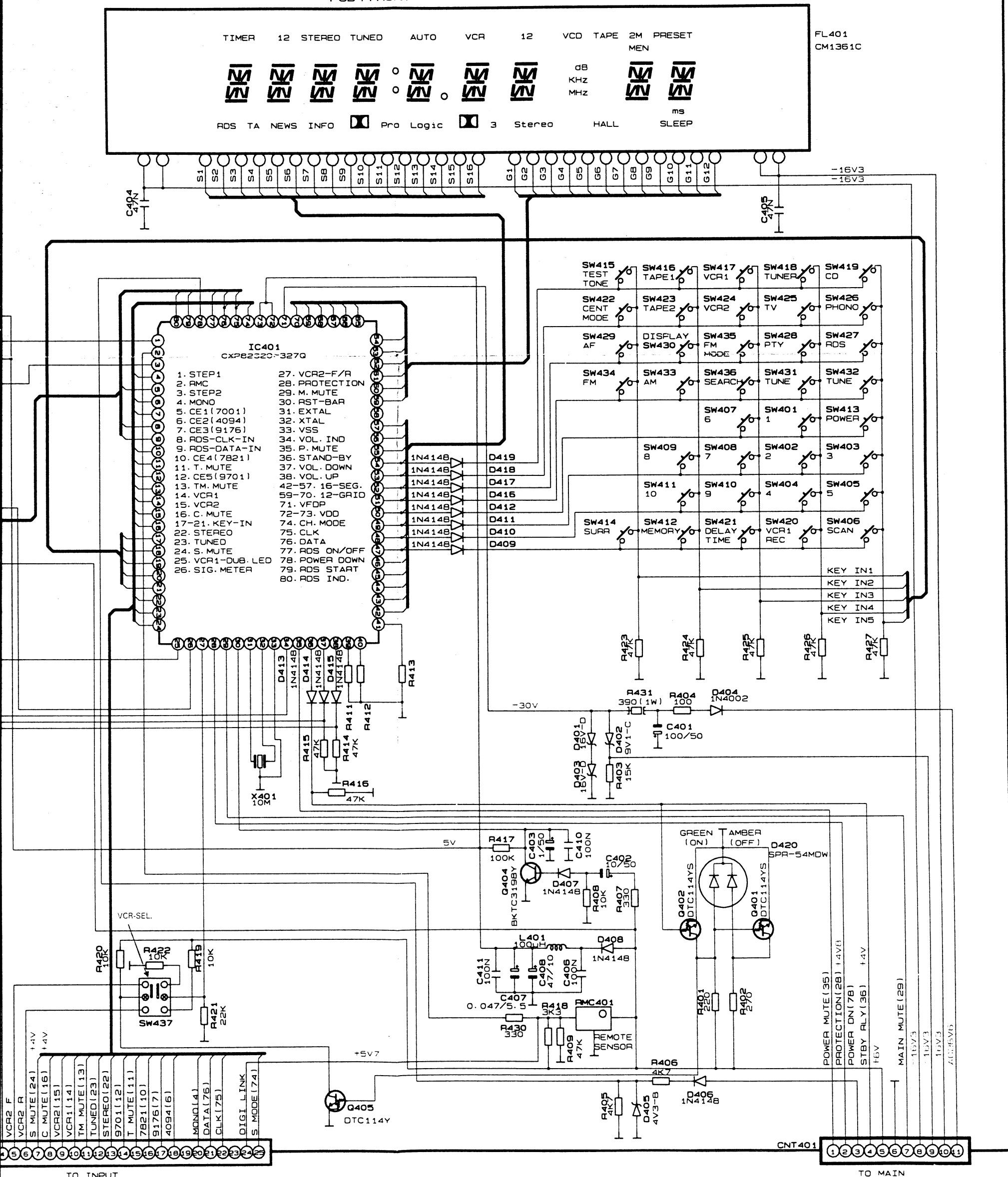
J

K

L

M

## PCB4 FRONT



# G

CP703  
FROM TONE  
Page(49)  
SCHEMATIC  
DIAGRAM(I)



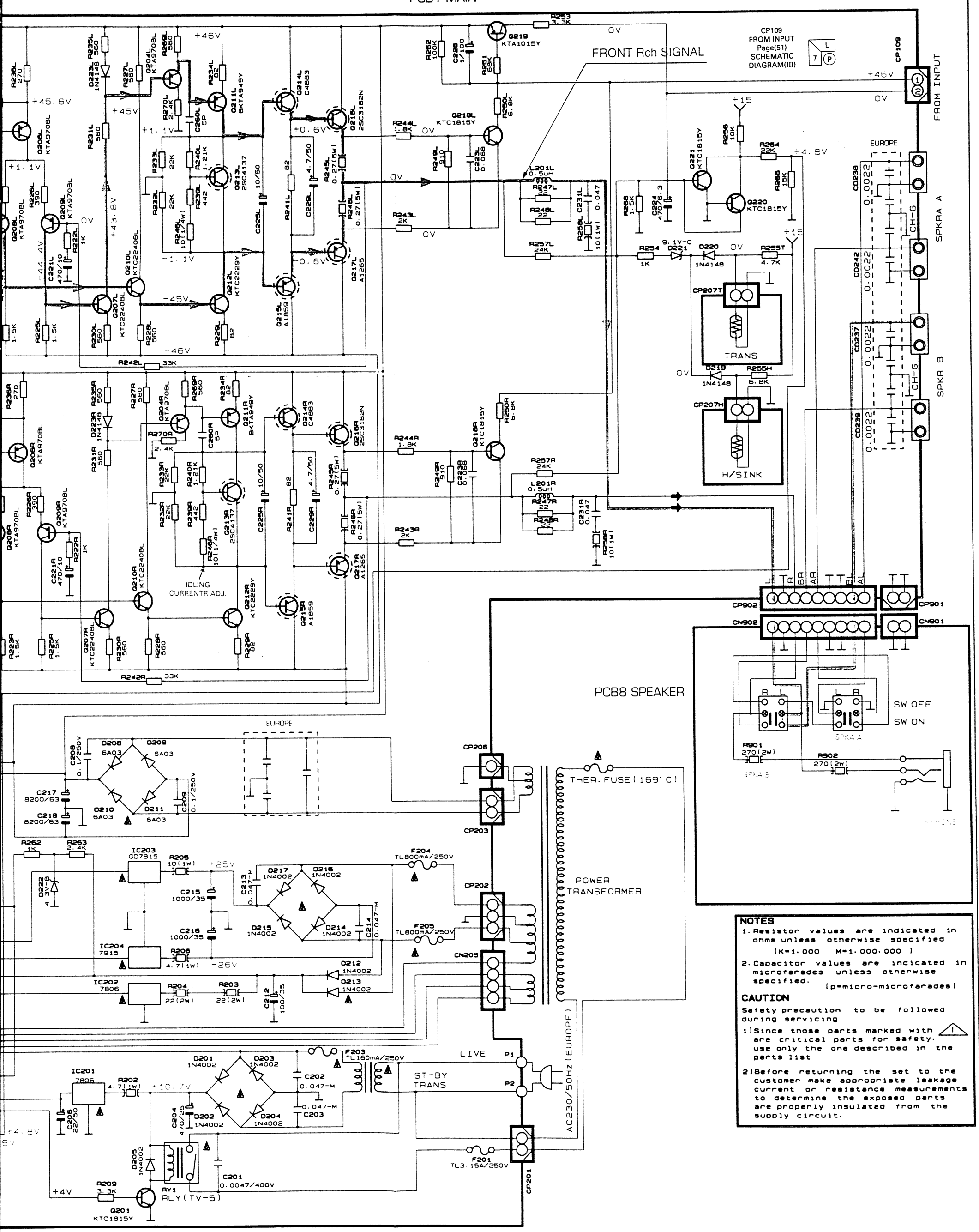
CP101  
TO INPUT  
Page(51)  
SCHEMATIC  
DIAGRAM(III)

CP104  
FROM INPUT  
Page(51)  
SCHEMATIC  
DIAGRAM(III)

[illegible]

G H I J K L M

PCB1 MAIN



**NOTES**

1. Resistor values are indicated in ohms unless otherwise specified  
[K=1.000 M=1.000.000]

2. Capacitor values are indicated in microfarads unless otherwise specified.  
[p=micro-microfarads]

**CAUTION**

Safety precaution to be followed during servicing

1) Since those parts marked with a triangle are critical parts for safety, use only the one described in the parts list

2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.

# SCHEMATIC DIAGRAM III

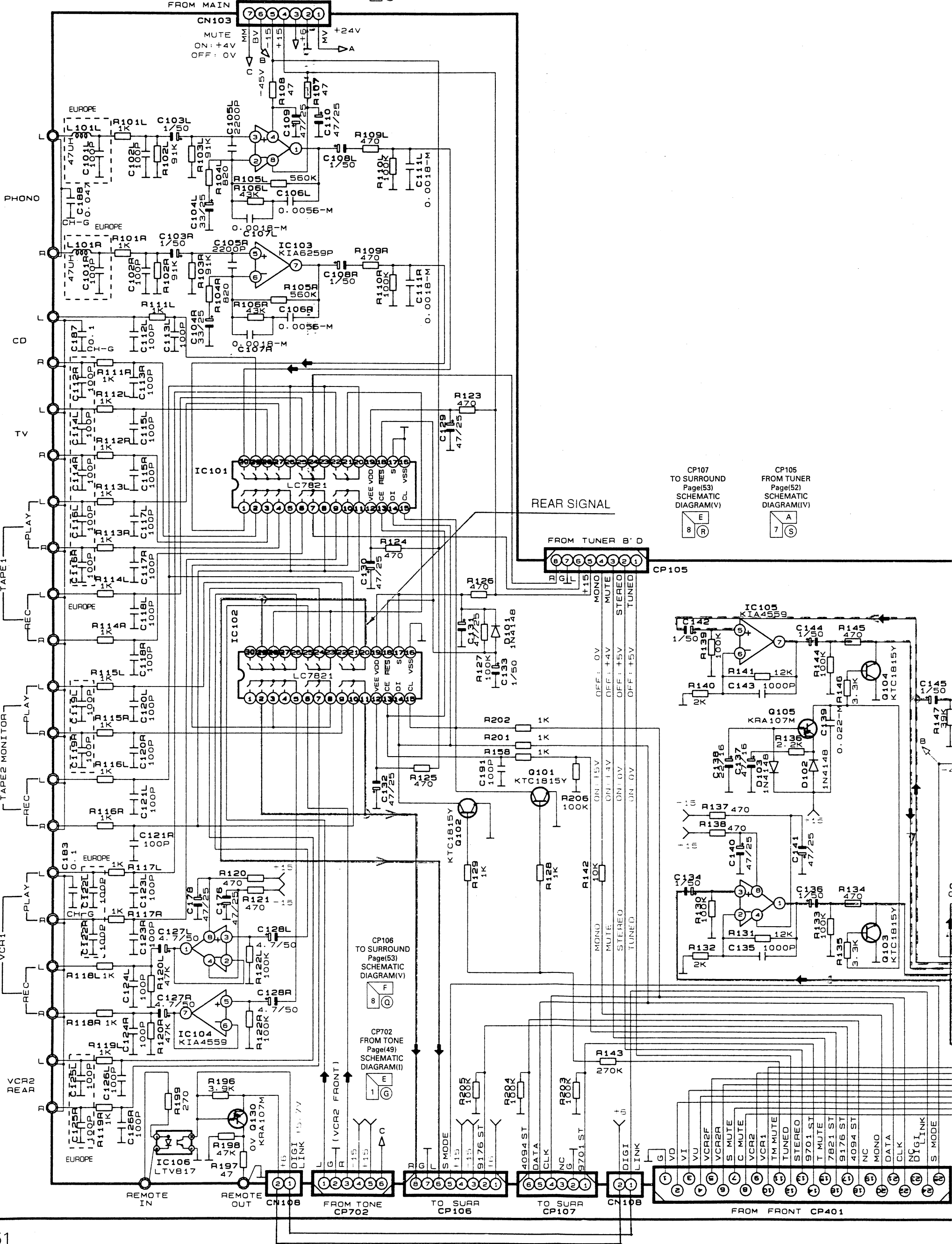
A B C D E F G

CN103  
FROM MAIN  
Page(50)  
SCHEMATIC  
DIAGRAM(II)

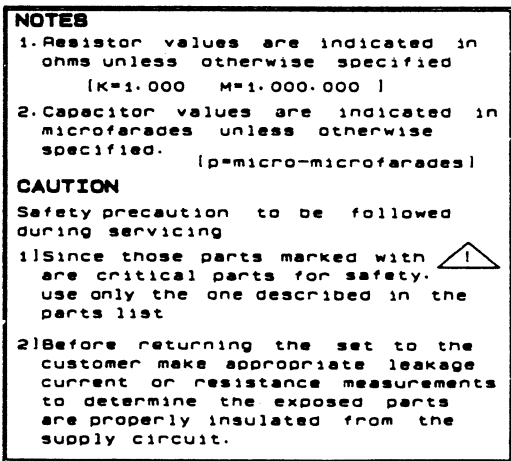
F  
7  
K

FROM MAIN

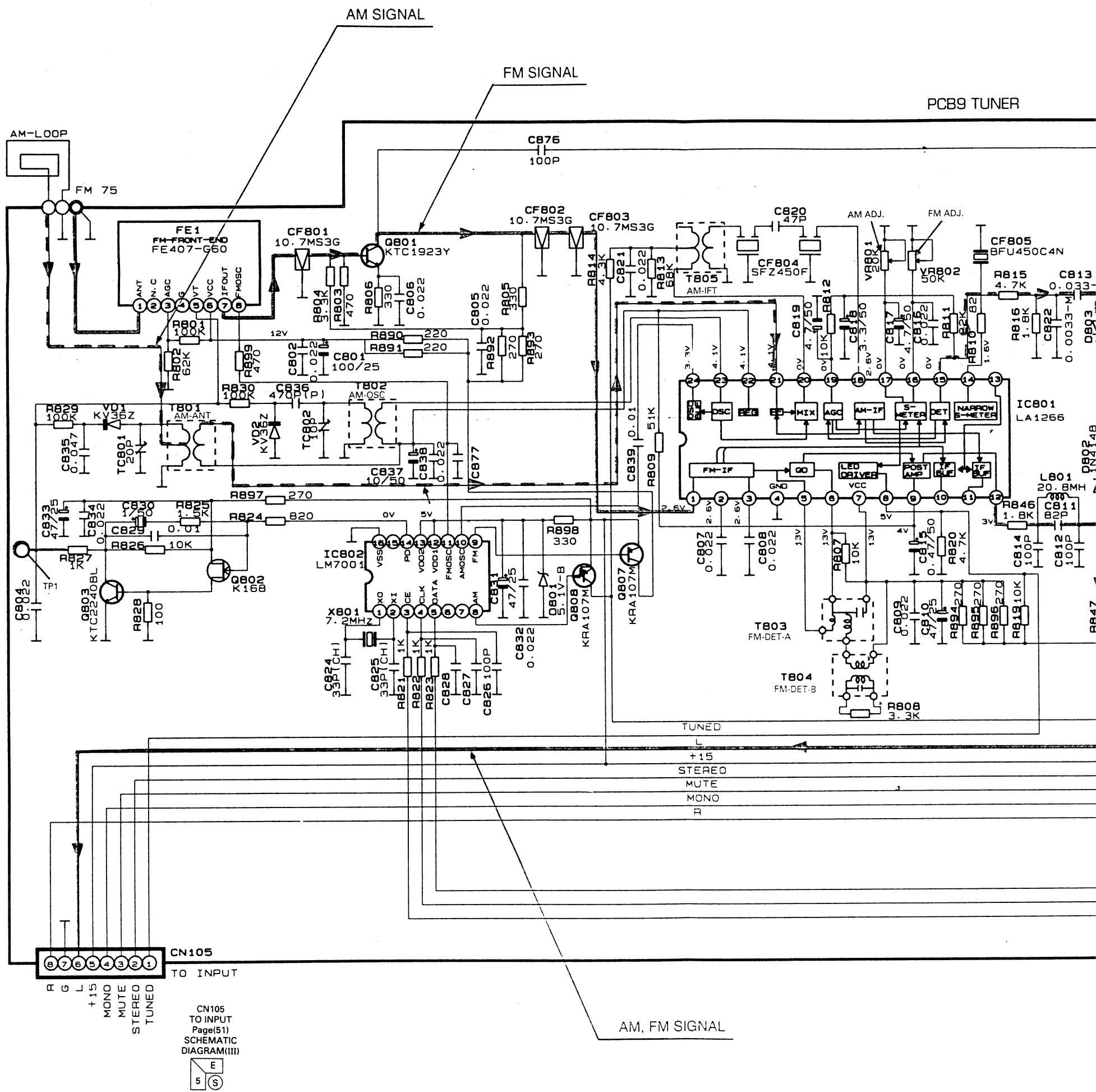
CN103  
MUTE  
ON: +4V  
OFF: 0V







### SCHEMATIC DIAGRAM IV



G

H

I

J

K

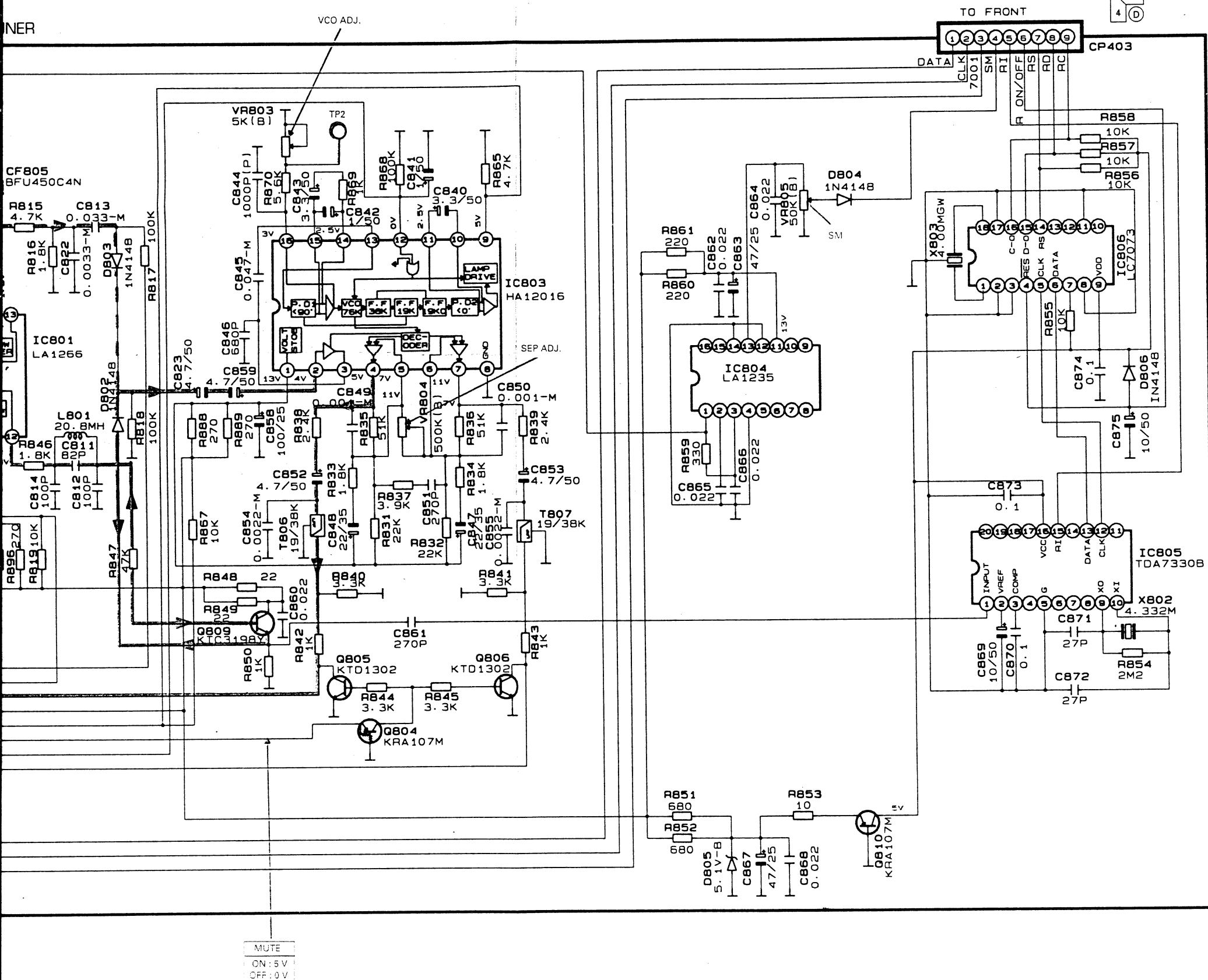
L

M

CP403  
TO FRONT  
Page(49)  
SCHEMATIC  
DIAGRAM(I)

F  
4 D

NER




## NOTES

1. Resistor values are indicated in ohms unless otherwise specified  
(K=1,000 M=1,000,000)
2. Capacitor values are indicated in microfarads unless otherwise specified.  
(p=micro-microfarads)

## CAUTION

Safety precaution to be followed during servicing

- 1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.



# A

# B

C

D

# E

F

# G

1

2

3

4

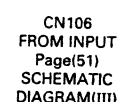
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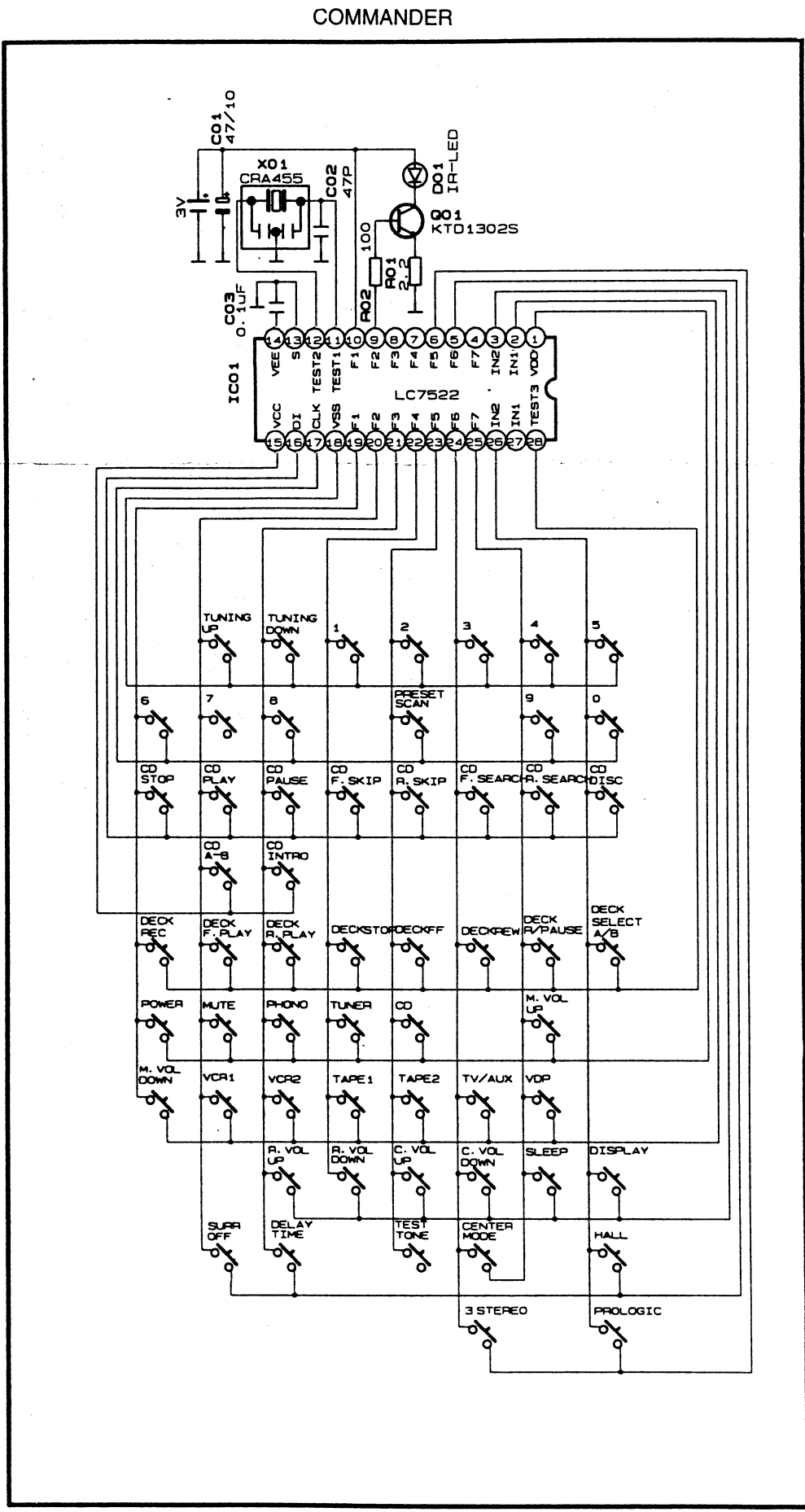
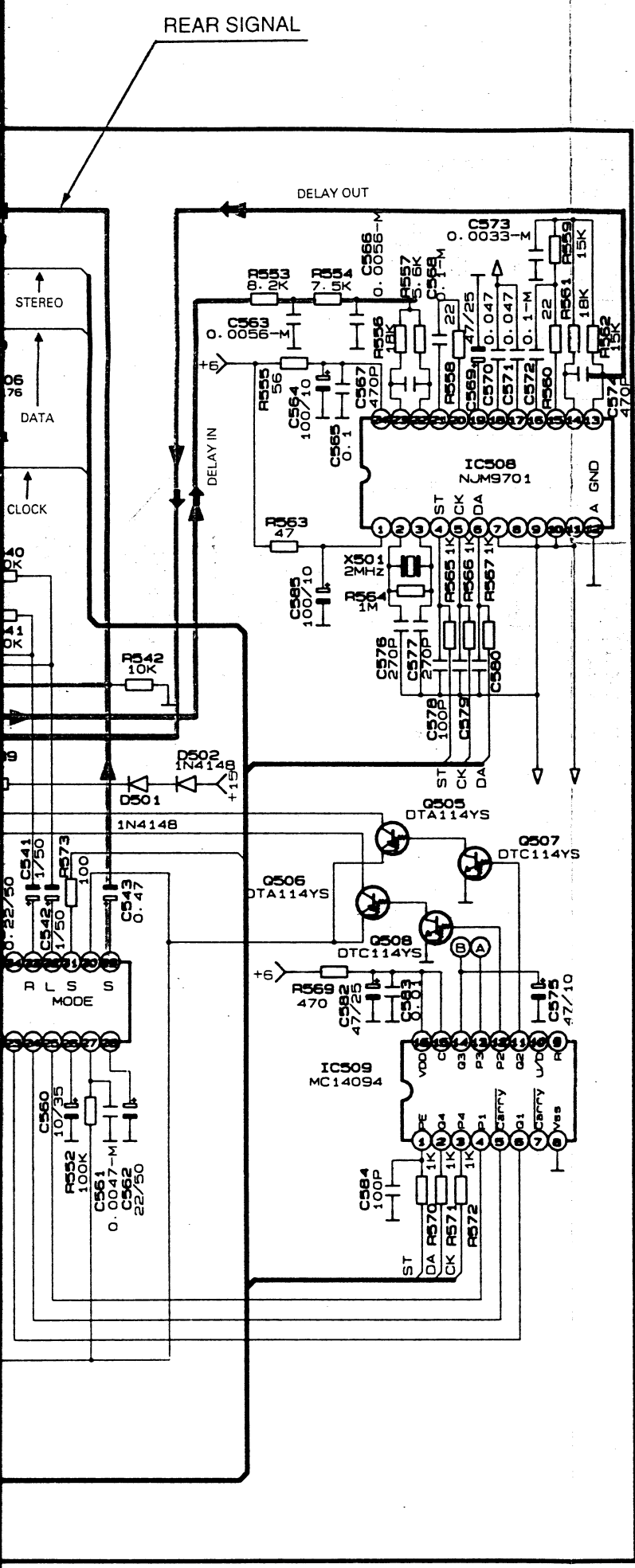
6

7


8

9





**NOTES**  
1. Resistor values are indicated in ohms unless otherwise specified [K=1,000 M=1,000,000]  
2. Capacitor values are indicated in microfarads unless otherwise specified. [p=micro-microfarads]

**CAUTION**  
Safety precaution to be followed during servicing  
1) Since those parts marked with  are critical parts for safety, use only the one described in the parts list  
2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.